

New Alternatives: Alternatives 4A, 2D, and 5A

4.1 Introduction

As stated in Section 1, the RDEIR considers additional alternatives that meet the goals of restoring the ecological functions of the Delta and improving water supply reliability. These alternatives were developed in response to input from the Draft EIR/EIS comment period as well as from USFWS, NMFS, and DFW regarding the challenges with meeting the standards required to issue long term assurances associated with compliance with Section 10 of the ESA and the NCCPA. Specifically among the comments received on the Draft EIR/EIS was the suggestion that DWR should pursue permit terms shorter than 50 years due to the levels of uncertainty regarding both the long-term effectiveness of habitat restoration in recovering fish populations and the future effects of climate change on the Delta and the Sacramento River watershed. Other comments suggested that the proposed conveyance facilities should be untethered from the habitat restoration components of the BDCP, with the latter to be pursued separately.

Consistent with this public input, the Lead Agencies are analyzing an alternative implementation strategy considered within the new alternatives in this RDEIR/SDEIS (Alternatives 4A, 2D, and 5A). The alternative implementation strategy relates to achieving the project objectives and purpose and need, focusing on the conveyance facility improvements necessary for the SWP to address more immediate water supply reliability needs in conjunction with ecosystem improvements to significantly reduce reverse flows and direct fish species impacts associated with the existing south Delta intakes. The alternative implementation strategy allows for other state and federal programs to address the long term conservation efforts for species recovery in programs separate from the proposed project.

The primary differences between Alternatives 4A, 2D, and 5A presented in this RDEIR/SDEIS and Alternatives 4, 2A, and 5 presented in the BDCP Draft EIR/EIS are as follows. The California Department of Water Resources (DWR) would not seek 50-year permits for the Alternatives 4A, 2D, or 5A. The originally proposed BDCP habitat restoration measures and related CMs (i.e., CM2 through CM21) would not be included as parts of Alternatives 4A, 2D, and 5A, except to the extent required to mitigate significant environmental effects under CEQA and meet the regulatory standards of ESA Section 7 and CESA Section 2081(b).

Alternatives 4A, 2D, and 5A would not serve as an-habitat conservation plans/natural community conservation plans (NCCP)(HCPs/HCPNCCPs) under ESA Section 10 and the Natural Community Conservation Planning Act, but rather would achieve incidental take authorization under ESA Section 7 and California Endangered Species Act (CESA) Section 2081(b).

Alternatives 4A, 2D, and 5A would enable DWR to construct and operate new conveyance facilities that improve conditions for endangered and threatened aquatic species in the Delta while at the same time improving water supply reliability, consistent with California law (see, e.g., Cal.Wat. Code, § 85001[c]). Implementing the conveyance facilities alone, as now proposed under Alternatives 4A, 2D, and 5A, would help resolve many of the concerns with the current south Delta conveyance system, and would help reduce threats to endangered and threatened species in the Delta. For

instance, implementing a dual conveyance system would align water operations to better reflect natural seasonal flow patterns by creating new water diversions in the north Delta equipped with state-of-the-art fish screens, thus reducing reliance on south Delta exports.

The existing operation of the SWP and CVP pumps in the south Delta can cause reversals in river flows, potentially altering salmon migratory patterns and contributing to the decline of sensitive fish species such as delta smelt. The new system would reduce the ongoing physical impacts associated with sole reliance on the southern diversion facilities and allow for greater operational flexibility to better protect fish. Minimizing south Delta pumping would provide more natural east-west flow patterns. The new diversions would also help protect critical water supplies against the threats of sea level rise and earthquakes, and DWR would not seek 50-year permits.

Alternative 4A separates the proposed conveyance facilities (CM1) from the originally proposed habitat restoration measures and related CMs (i.e., CM2 through CM2.1). [Note to reviewers: text pending re: state program implementing elements of these through CWAPO]

As described and analyzed in this RDEIR/SDEIS, the new CEQA Preferred Alternative—Although Alternatives 4A, 2D, and 5A—comprises only the conveyance facilities and operations that formerly constituted CM1; it and no longer includes habitat restoration measures beyond those needed to provide full mitigation under for specific regulatory compliance purposes CEQA and NEPA. Nevertheless, habitat restoration is still recognized as a critical component of the State's long-term plans for the Delta, and such endeavors will likely be implemented over time under actions separate and apart from Alternative 4A these alternatives. If Alternative 4A, 2D, or 5A is approved at the end of the CEQA/NEPA process, restoration of habitat in the Delta, beyond Alternative 4A's these alternatives' mitigation requirements, will instead occur through implementation of the California Water Action Plan California EcoRestore¹, and these activities will be further developed and evaluated independent of the water conveyance facilities.

To address concerns regarding the regulatory approach, Although DWR and Reclamation have identified Alternative 4A these alternatives as with a new implementation strategy, they are approach that is nevertheless consistent with the Coordinated Operations Agreement (COA) governing the joint coordinated operation of the federal Central Valley Project (CVP) CVP and State Water Project (SWP) SWP. Alternative 4A These new alternatives would, like Alternative 4, address compliance with federal and state endangered species laws with respect to the operation of the existing State Water Project (SWP) Delta intake and conveyance facilities, as well as for the construction and operation of conveyance facilities for the movement of water entering the Delta from the Sacramento Valley watershed to the existing SWP and federal Central Valley Project (CVP) pumping plants in the southern Delta. Under this new modified approach, DWR would seek from CDFW an incidental take permit of much shorter duration under Fish and Game Code Section 2081(b) of the California Endangered Species Act (CESA). CDFW would review the application to determine if the action would meet the standards of Section 2081(b), which include requirements that the impacts of authorized take be minimized and fully mitigated. Reclamation would consult under Section 7 with the U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS) and DWR would be an applicant in the Section 7 process. Reclamation and DWR would jointly develop and submit a biological assessment to USFWS and NMFS. USFWS and NMFS would then prepare a biological opinion (BiOp) on whether the proposed activity would jeopardize the species addressed in the consultation.

¹ https://s3.amazonaws.com/californiawater/pdfs/ECO_FS_Overview.pdf

As revised, Alternatives 4A would enable DWR to construct and operate new conveyance facilities that improve conditions for endangered and threatened aquatic species in the Delta while at the same time improving water supply reliability, consistent with California law (see, e.g., Cal. Wat. Code, § 85001[c]). Implementing the conveyance facilities alone, as now proposed, would help resolve many of the concerns with the current south Delta conveyance system, and would help reduce threats to endangered and threatened species in the Delta. For instance, implementing a dual conveyance system would align water operations to better reflect natural seasonal flow patterns by creating new water diversions in the north Delta equipped with state-of-the-art fish screens, thus reducing reliance on south Delta exports.

The existing operation of the SWP and CVP pumps in the south Delta can cause reversals in river flows, potentially altering salmon migratory patterns and contributing to the decline of sensitive fish species such as delta smelt. The new system would reduce the ongoing physical impacts associated with sole reliance on the southern diversion facilities and allow for greater operational flexibility to better protect fish. Minimizing south Delta pumping would provide more natural east-west flow patterns. The new diversions would also help protect critical water supplies against the threats of sea level rise and earthquake.

Although habitat restoration in the Delta would still occur pursuant to the California Water Action Plan, Alternatives 4A is in no way linked to, or in any way dependent on, any future decisions regarding future habitat restoration projects. Approval of the revised project would not legally or practically compel completion of additional habitat restoration. Neither would additional habitat restoration not contemplated in Alternative 4A be a reasonably foreseeable consequence of the revised project. This means that the conveyance facilities included in the revised project would have “independent utility” apart from habitat restoration and would therefore be an independently justified separate project.

4.1.1 Rationale for Revisions to the Proposed Project

At their cores, both CEQA and NEPA are intended to allow agency decision makers and members of the public to consider the environmental consequences of proposed actions and to consider ways of reducing or avoiding adverse impacts. The statutes function best when agencies use the information they acquire through the environmental review process to modify their proposed actions to make them more environmentally benign.

California courts have recognized that project changes are a desirable and foreseeable byproduct of the CEQA process. In fact, courts have noted that CEQA “encourages” public agencies to revise projects in light of new information revealed during the CEQA process.² Indeed, as the courts have emphasized, “one of the major objectives of the CEQA process ...[is] to foster better (more environmentally sensitive) projects through revisions which are precipitated by the preparation of EIRs.”³ It is thus “the very nature of CEQA” that “projects will be ‘modified’ to protect the environment.”⁴

As further noted by the courts, “[t]he CEQA reporting process is not designed to freeze the ultimate proposal in the precise mold of the initial project; indeed, new and unforeseen insights may emerge

² *Citizens for a Sustainable Treasure Island v. City and County of San Francisco* (2014) 227 (Treasure Island).

³ / *County of Orange v. Superior Court* (2003) 113 Cal.App.4th 1, 10.

⁴ *Ibid.*

during investigation, evoking revision of the original proposal.”⁵ Project reductions, in particular, are encouraged to the extent that they address environmental needs and facilitate the goals of CEQA. In certain situations, for example, an agency may approve only a portion of the project analyzed in an EIR.⁶ As one court summarized these points, “CEQA compels an interactive process of assessment of environmental impacts and responsive project modification which must be genuine. It must be open to the public, premised upon a full and meaningful disclosure of the scope, purposes, and effect of a consistently described project, with flexibility to respond to unforeseen insights that emerge from the process.’ In short, a project must be open for public discussion and subject to agency modification during the CEQA process.”⁷

NEPA imposes similar obligations on federal agencies and, like CEQA, encourages project revisions based on environmental concerns brought to light during the environmental review process. Although NEPA, unlike CEQA, is considered a “purely procedural statute” (meaning that it does not mandate particular results), it provides the necessary process to ensure that federal agencies take a “hard look” at the environmental consequences of their actions.⁸

NEPA and its implementing regulations specifically require federal officials to consider the recommendations of other government entities and the public who present reasonable solutions or alternative approaches that may improve a proposed action. In fact, when preparing a Final EIS, a federal lead agency must respond to comments on a Draft EIS in one of several ways, “including by modifying alternatives including the proposed action and by developing and evaluating alternatives not previously given serious consideration by the agency.”⁹ As stated in the NEPA regulations, “[u]ltimately, of course, it is not better documents but better decisions that count. NEPA’s purpose is not to generate paperwork—even excellent paperwork—but to foster excellent action. The NEPA process is intended to help public officials make decisions that are based on understanding of environmental consequences, and take actions that protect, restore, and enhance the environment.”¹⁰

Accordingly, like CEQA, NEPA encourages agencies to make changes to proposed projects based on information gathered during the environmental review process and based on public comments received on a Draft EIS. The NEPA regulations note that “[a]n agency can modify a proposed action in light of public comments received in response to a draft EIS.”¹¹ Moreover, federal courts have long recognized that “agencies must have some flexibility to modify alternatives canvassed in the Draft

⁵ / *Kings County Farm Bureau v. City of Hanford* (1990) 221 Cal.App.3d 692, 736–737, quoting *County of Inyo v. City of Los Angeles* (1977) 71 Cal.App.3d 185, 199; see also *River Valley Preservation Project v. Metropolitan Transit Development Bd.* (1995) 37 Cal. App. 4th 154, 168, fn. 11.

⁶ / See *Dusek v. Anaheim Redevelopment Agency* (1985) 173 Cal.App.3d 1029, 1041 [decisionmakers have “the flexibility to implement that portion of a project which satisfies their environmental concerns”].

⁷ / *Concerned Citizens of Costa Mesa, Inc. v. 32nd District Agricultural Association* (1986) 42 Cal.3d 929, 936.

⁸ / *Muckleshoot Indian Tribe v. U.S. Forest Serv.* (9th Cir.1999) 177 F.3d 800, 814 (quoting *Robertson v. Methow Valley Citizens Council* (1989) 490 U.S. 332, 350) (quotation marks omitted).

⁹ / 40 C.F.R. § 1503.4(a).

¹⁰ / 40 C.F.R. § 1500.1(c).

¹¹ / See 40 C.F.R. § 1503.4(a).

EIS to reflect public input.”¹² Indeed, the very purpose of a Draft EIS and the ensuing comment period is to elicit suggestions and criticisms to enhance the proposed project.¹³

As the forgoing discussion demonstrates, a primary measure of success under both CEQA and NEPA is when the environmental review process and public comments prompt the lead agencies to make changes that result in a project that is better than the original proposal. That is precisely what has occurred here. Because of the robust public response during the extended public comment period on the Draft EIR/EIS, as well as the data acquired during the environmental review process, ~~DWR and the federal lead~~ Lead ~~a~~ Agencies have been able to better identify and understand the proposed project’s potential adverse effects, and have been able to identify a solution that will reduce many of these impacts and ease the burden on the environment and Delta communities.

4.1.2 Description of Alternative 4A

4.1.2.1 Water Conveyance Facility Construction and Maintenance

Under Alternative 4A, water conveyance facilities would be constructed and maintained identically to those proposed and analyzed under Alternative 4 (including the modifications described in Section 3, *Alternative 4: Conveyance Facility Modifications*). Water would primarily be conveyed from the north Delta to the south Delta through pipelines/tunnels. Water would be diverted from the Sacramento River through three fish-screened intakes on the east bank of the Sacramento River between Clarksburg and Courtland (Intakes 2, 3, and 5). Water would travel from the intakes to a sedimentation basin before reaching the tunnels. From the intakes water would flow into an initial single-bore tunnel, which would lead to an intermediate forebay on Glannvale Tract. From the southern end of this forebay, water would pass through an outlet structure into a dual-bore tunnel where it would flow by gravity to the south Delta. Water would then reach pumping plants northeast of the Clifton Court Forebay, where it would be pumped into the north cell of the expanded Clifton Court Forebay from the tunnels. The forebay would be dredged and redesigned to provide an area ~~that would isolate~~ isolating water flowing from the new north Delta facilities from water diverted from south Delta channels.

¹² / *California v. Block* (9th Cir.1982) 690 F.2d 753, 771; *Russell Country Sportsmen v. U.S. Forest Service* (9th Cir. 2011) 668 F.3d 1037, 1045.]

¹³ / *City of Carmel-By-The-Sea v. U.S. Dept. of Transp.* (9th Cir 1997) 123 F.3d 1142, 1156; see also *National Committee for the New River v. FERC* (D.C. Cir. 2004) 373 F.3d 1323, 1329 [“By its very name, the [Draft] EIS is a draft of the agency’s proposed [Final] EIS, and as such the purpose of a [Draft] EIS ‘is to elicit suggestions for change’”], quoting *City of Grapevine, Tex. v. Dept. of Transp.* (D.C. Cir. 1994) 17 F.3d 1502, 1507.

Table 4.1-1. Comparison of Alternative 4 and Alternative 4A

Element of Project Description	Alternative 4 (BDCP)	Alternative 4A
ESA Compliance	Section 10	Section 7
CESA Compliance	NCCP	2081(b) permit
Facilities	Modified Pipeline/Tunnel Alignment: 3 intakes, 9,000 cfs	Modified Pipeline/Tunnel Alignment: 3 intakes, 9,000 cfs
Operations	Dual Conveyance; <u>Operational Scenarios H1–H4 with Decision Tree (see Chapter 3, Section 3.6.4.2 of the Draft EIR/EIS);</u> evaluated at LLT	Dual Conveyance; <u>Operational Scenario H3+ (a new operational scenario which includes a criterion for spring outflow bounded by the criteria associated with Scenarios H3 and Scenario H4, as described in Chapter 3, Section 3.6.4.2 of the Draft EIR/EIS);</u> evaluated as Scenarios H3-H4 at <u>ELT</u> <u>Early long-term (ELT, which is associated with conditions around 2025)</u>
Conservation Measures/ Environmental Commitments	Conservation Measures 2–21; includes Yolo Bypass Improvements and 65,000 acres of tidal wetland restoration	Environmental Commitments 3, 4, 6, 7, 8, 9, 10, 11, 12, 15, 16; includes up to 182,59 acres of tidal wetland restoration
CEQA Baseline	Existing Conditions	Existing Conditions
NEPA Baseline	No Action Alternative at LLT	No Action Alternative at ELT

A map and a schematic diagram depicting the conveyance facilities associated with Alternative 4A are provided in Mapbook Figure M3-4 in the Mapbook Volume and Figure 3-10 in Appendix A of this RDEIR/SDEIS. A new pumping facility would be constructed northeast of the north cell of the expanded Clifton Court Forebay, along with control structures to regulate the relative quantities of water flowing from the north Delta and the south Delta to the Banks and Jones Pumping Plants. Alternative 4A would entail the continued use of the SWP/CVP south Delta export facilities.

All aspects of water conveyance facility design, construction, and maintenance would be identical to those described for Alternative 4 in the revised text in Chapter 3, Sections 3.4, 3.5.9, and 3.6.1 and Appendix 3C, as provided in Appendix A, Revisions to the Draft EIR/EIS, of this RDEIR/SDEIS.

4.1.2.2 Water Conveyance Facility Operations

Operational components of the water conveyance facilities under Alternative 4A would be similar, but not identical, to those described under Scenario H in Chapter 3, Section 3.6.4.2 of the Draft EIR/EIS. ~~In contrast to the Scenario H operations proposed for Alternative 4 in the Draft BDCP, under Alternative 4A, the decision tree process would not be used to determine the outflow criteria to be applied at the start of new operations. Alternative 4A starting operations will be determined through the continued coordination process as outlined in the Section 7 consultation process and 2081(b) permit prior to the start of construction. An adaptive management and monitoring program, as described below, will be implemented to develop additional science during the course of project construction to inform and improve conveyance facility operational limits and criteria.~~ Additionally, operational elements associated with Fremont Weir modifications would not be incorporated as part of this alternative, because Yolo Bypass improvements previously contemplated in the BDCP (under CM2) would not be implemented as part of Alternative 4A; instead, they would be assumed to occur as part of the No Action Alternative because they are

required by the existing BiOps. For a detailed characterization of operational criteria, please refer to Table 4.1-2.¹⁴

Implementation of ~~the proposed action~~ Alternative 4A will include dual conveyance operations of both new and existing water conveyance facilities once the new north Delta facilities are completed and become operational, thereby enabling joint management of north and south Delta diversions. Operations included in ~~this proposed action~~ Alternative 4A for south Delta export facilities would replace the south Delta operations currently implemented in compliance with the FWS (2008) and NMFS (2009) BiOps. Alternative 4A also includes a new criterion for spring outflow to specifically avoid unacceptable effects on longfin smelt and a new minimum flow criterion requirement at Rio Vista from January through August. Additional spring outflow is proposed as mitigation to avoid any impacts to longfin smelt. The north Delta intakes and the head of Old River barrier (HORB) are new facilities for the SWP and CVP and would be operated consistent with the new proposed operating criteria for each of these facilities. The design of the head of Old River barrier is not yet complete, and should design change substantially from what is assumed in this RDEIR/SDEIS, such that there is a potential for new effects, additional CEQA and/or NEPA review would be required. All other criteria included in the FWS (2008) and NMFS (2009) BiOps and State Water Resources Control Board Water Right Decision 1641 (D-1641), including Fall X2, the E:I ratio, and operations of the Delta Cross Channel gates and the Suisun Marsh Salinity Control Gates will continue to be complied with as part of the continued operations of the CVP and SWP. As such, when compared with operations under the No Action Alternative, the proposed action Alternative 4A includes modified or new operations and criteria of only the following elements.

- North Delta ~~bypass flows~~ intake facilities.
- South Delta export operations.
- Head of Old River barrier operations.
- Spring Delta outflow.
- Rio Vista minimum flow standard in January through August.

The proposed criteria are further described in the following subsections and in Table 4.1-2. Alternative 4A operations include a preference for south Delta pumping in July through September to provide limited flushing for improving general water quality conditions and reduced residence times.

¹⁴ Note that these proposed operational criteria would only take effect after the proposed conveyance facilities are operational. Until that time, operations would occur as described in the USFWS 2008 and NMFS 2009 BiOps or as modified by the outcome of ongoing ESA compliance processes pertaining to operation of the existing facilities.

Table 4.1-2. New and Existing Water Operations Flow Criteria and Relationship to Assumptions in CALSIM Modeling

Parameter	Criteria	Summary of CALSIM Modeling ^a
New Criteria Included in the Proposed Action Alternative 4A		
North Delta bypass flows	<ul style="list-style-type: none"> • <u>Initial Pulse Protection:</u> <ul style="list-style-type: none"> ○ <u>Low-level pumping of up to 6% of total Sacramento River flow such that bypass flow never falls below 5,000 cfs. No more than 300 cfs can be diverted at any one intake.</u> ○ <u>If the initial pulse begins and ends before Dec 1, post-pulse criteria for May go into effect after the pulse until Dec 1. On Dec 1, the Level 1 rules defined below in Table 3-16 in the Draft EIR/EIS apply until a second pulse, as defined above, occurs. The second pulse will have the same protective operation as the first pulse.</u> • <u>Post-pulse Criteria (specifies bypass flow required to remain downstream of the North Delta intakes):</u> <ul style="list-style-type: none"> ○ <u>October, November: bypass flows of 7,000 cfs before diverting at the North Delta intakes.</u> ○ <u>July, August, September: bypass flows of 5,000 cfs before diverting at the North Delta intakes.</u> • <u>December through June: post-pulse bypass flow operations will not exceed Level 1 pumping unless specific criteria have been met to increase to Level 2 or Level 3 as defined in the Section 3.6.4 of the Draft EIR/EIS. If those criteria are met, operations can proceed as defined in Table 3.4.1-2 in the BDCP Public draft. The specific criteria for transitioning between and among pulse protection, Level 1, Level 2, and/or Level 3 operations, will be developed and based on real-time fish monitoring and hydrologic/behavioral cues upstream of and in the Delta. <include specific transitioning criteria when available>.</u> During operations, adjustments are expected to be made to improve water supply and/or migratory conditions for fish by making real-time adjustments to the pumping levels at the north Delta diversions. These adjustments would be managed under October, November: Flows will exceed 7,000 cfs. • <u>July, August, September: Flows will exceed 5,000 cfs.</u> • <u>December through June: post-pulse bypass flow operations will not exceed Level 1 pumping unless specific criteria have been met to increase to level 2 or level 3. If those criteria are met, operations can proceed as defined in Table 3-21⁵. The specific criteria for transitioning between and among pulse protection, Level 1, Level 2, and/or Level 3 operations, will be developed and based on real-time fish monitoring and hydrologic/behavioral cues upstream of and in the Delta. During operations, adjustments are expected to be made to improve water supply and/or migratory conditions for fish by making real-time adjustments to the pumping levels at the north Delta</u> 	<ul style="list-style-type: none"> • Same as CM1 criteria, as proposed in the Draft BDCP (hereafter "CM6.4 1 criteria").

Reference from BDCP Public draft

Parameter	Criteria	Summary of CALSIM Modeling ^a
South Delta operations	<p>diversions. These adjustments would be managed under Real Time Operations (RTO).</p> <ul style="list-style-type: none"> October, November: Flows will not be more negative than an average of -2,000 cfs during D-1641 San Joaquin River pulse periods. No south Delta exports during the D-1641 San Joaquin River 2-week pulse, no Old and Middle River (OMR) flow restriction during 2 weeks prior to pulse, and a monthly average of or -5,000 cfs during nonpulse periods in November after pulse. December: OMR flows will not be more negative than an average of -5,000 cfs when the Sacramento River at Wilkins Slough pulse triggers, and no more negative than an average of -2,000 cfs when the delta smelt action 1 triggers. No OMR flow restriction prior to the Sacramento River pulse, or delta smelt action 1 triggers. January, February¹⁶: OMR flows will not be more negative than a monthly average of 0 cfs during wet years, -3,500 cfs during above-normal years, or -4,000 cfs during below-normal to critical years, except -5,000 in January of dry and critical years. March¹⁷: OMR flows will not be more negative than a monthly average of 0 cfs during wet or above-normal years or -3,500 cfs during below-normal and dry year and -3,000 cfs during critical years. April, May: Allowable OMR flows depend on gaged flow measured at Vernalis, and will be determined by a linear relationship. The following values were used in the CALSIM II modeling. If Vernalis flow is below 5,000 cfs, Old and Middle Rivers (OMR) flows will not be more negative than -2,000 cfs. If Vernalis is 5,000 to 6,000 cfs, OMR flows will not be less than +more negative than =1,000 cfs. If Vernalis is 10, exceeds 6,000 cfs, OMR flows will be at least 1,000 cfs. If Vernalis exceeds 10,000 cfs, OMR flows will be at least +2,000 cfs. If Vernalis exceeds 15,000 cfs, OMR flows will be at least +3,000 cfs. If Vernalis is at or exceeds 30,000 cfs, OMR flows will be at least 6,000 cfs. June: Similar to April, allowable flows depend on gaged flow measured at Vernalis. However, if Vernalis is less than 3,500 cfs, OMR flows will not be more negative than -3,500 cfs. If Vernalis exceeds 3,500 cfs and up to 10,000 cfs, OMR flows will be at least 0 cfs. If Vernalis exceeds 10,000 cfs and up to 15,000 cfs, OMR flows will be at least +1,000 cfs. If Vernalis exceeds 15,000 cfs, OMR flows will 	<ul style="list-style-type: none"> October, November: Assumed no south Delta exports during the D-1641 San Joaquin River 2-week pulse, no OMR restriction during 2 weeks prior to pulse, and -5,000 cfs in November after pulse. December: -5,000 cfs only when the Sacramento River pulse based on the Wilkins Slough flow (same as the pulse for the north Delta diversion) occurs, if no OMR requirement was applied. If the USFWS (2008) BiOp Action 1 is triggered, after which -2,000 cfs requirement is assumed. April, May: OMR requirement for the Vernalis flows falling between the specified flows were determined by linear interpolation. When Vernalis flow is between 5,000 cfs and 6,000 cfs, OMR requirement is determined by linearly interpolating between -2,000 cfs and +1,000 cfs. January–March and July–September: Same as CM1 criteria

¹⁶ Sacramento River 40-30-30 index based water year types. For January and February, anticipated water year type based on the forecasted hydrology will be used. CALSIM II modeling uses previous water year type for October through January, and the current water year type from February onwards.

¹⁷ Sacramento River 40-30-30 index based water year types. For March, anticipated water year type based on the forecasted hydrology will be used. CALSIM II modeling uses previous water year type for October through January, and the current water year type from February onwards.

Parameter	Criteria	Summary of CALSIM Modeling ^a																				
	<p>be at least <u>+2,000 cfs.</u></p> <ul style="list-style-type: none">July, August, September: No <u>OMR flow constraints.</u>																					
Head of Old River gate operations	<ul style="list-style-type: none"><u>October 1–November 30th: Real-time operations (RTO) management in order to protect the D-1641 pulse flow designed to attract upstream migrating adult Fall-Run Chinook Salmon. HORB will be closed approximately 50% during the time immediately before and after the SJR pulse and that it will be fully closed during the pulse unless new information suggests alternative operations are better for fish.</u><u>January: When salmon fry are migrating, (determined based on real time monitoring), initial operating criterion will be to close the gate subject to RTO for purposes of water quality, stage, and flood control considerations.</u>February–June 15th: Initial operating criterion will be to close the gate subject to RTO for purposes of water quality, stage, and flood control considerations. The agencies will actively explore the implementation of reliable juvenile salmonid tracking technology which may enable shifting to a more flexible real time operating criterion based on the presence/absence of covered fishes.June 16 to September 30, December: Operable gates will be open.	<ul style="list-style-type: none">Assumed 50% open from January 1 to June 15, and during days in October prior to the D-1641 San Joaquin River pulse. <u>Closed during the pulse. 100% open in the remaining months.</u>																				
Spring outflow	<ul style="list-style-type: none">March, April, May: <u>To ensure that Alternative 4A does not result in continued reduction of longfin smelt abundance, initial operations will provide a March–May average Delta outflow scaled to the table below (based on the 90% forecast of eight-river index for the water year) bounded by the requirements of Scenario H3, which are consistent with D-1641 standards, and Scenario H4, which would be scaled to Table 3-24 in Chapter 3, Section 3.6.4.2 of the Draft EIR/EIS to ensure that the proposed action does not result in continued reduction of longfin smelt abundance. Over the course of the 2081 permit term the longfin smelt indices of annual recruitment based upon the 1980–2011 trend in recruitment relative to winter-spring flow conditions will be used to evaluate the effect of operations on longfin smelt (i.e., evaluate positive cohort over cohort population growth). Adjustments to these outflow targets may be made using the Adaptive Management Process and the best available scientific information available regarding all factors affecting longfin smelt abundance.</u> <p>March–May Average Outflow Criteria</p> <table><tr><th>Exceedance</th><th>Outflow criterion (cfs)*</th></tr><tr><td>10%</td><td>44,500</td></tr><tr><td>20%</td><td>44,500</td></tr><tr><td>30%</td><td>35,000</td></tr><tr><td>40%</td><td>27,900</td></tr><tr><td>50%</td><td>20,700</td></tr><tr><td>60%</td><td>16,800</td></tr><tr><td>70%</td><td>13,500</td></tr><tr><td>80%</td><td>11,500</td></tr><tr><td>90%</td><td>9,100</td></tr></table>	Exceedance	Outflow criterion (cfs)*	10%	44,500	20%	44,500	30%	35,000	40%	27,900	50%	20,700	60%	16,800	70%	13,500	80%	11,500	90%	9,100	<ul style="list-style-type: none">Same as CM1 criteria, assuming outflow from export reductions first, then Oroville releases
Exceedance	Outflow criterion (cfs)*																					
10%	44,500																					
20%	44,500																					
30%	35,000																					
40%	27,900																					
50%	20,700																					
60%	16,800																					
70%	13,500																					
80%	11,500																					
90%	9,100																					

Parameter	Criteria	Summary of CALSIM Modeling ^a
	<p>* Values based on Mar – May average Delta Outflow modeled under No Action Alternative considering the climate change and sea level rise effects projected at Early Long Term (around year 2025), and not including San Joaquin River Restoration Flows.</p> <p>* In operating to the above criteria, the outflow targets will be selected based on the 90% forecast of the eight river index starting at the end of February and adjusted monthly in response to hydrologic/runoff conditions.</p> <p>* Outflow can be achieved through export reductions, Oroville releases, and/or water acquired for environmental benefits.</p>	
Rio Vista minimum flow standard	<ul style="list-style-type: none"> January through August: flows will exceed 3,000 cfs September through December: flows per D-1641 	<ul style="list-style-type: none"> Same as CM1 criteria
Key Existing Criteria Included in Modeling		
Fall outflow	<ul style="list-style-type: none"> No change. September, October, November implement the USFWS (2008) BiOp <u>Fall X2 requirements. However, similar to spring Delta outflow and consistent with the existing RPA adaptive management, adjustments to these outflow targets may be made using the Adaptive Management and Monitoring Program described below and the best available scientific information available regarding all factors affecting delta smelt abundance.</u> 	<ul style="list-style-type: none"> Same as <u>CM1</u> criteria.
Winter and summer outflow	<ul style="list-style-type: none"> No change. Flow constraints established under D-1641 will be followed <u>if not superseded by criteria listed above.</u> 	<ul style="list-style-type: none"> Same as <u>CM1</u> criteria.
Delta Cross Channel Gates	<ul style="list-style-type: none"> No change. Operations as required by NMFS (2009) BiOp Action 4.1 and D-1641. 	<ul style="list-style-type: none"> Delta Cross Channel gates are closed for a certain number of days during October 1 through December 14 based on the Wilkins Slough flow, and the gates may be opened if the D-1641 Rock Slough salinity standard is violated because of the gate closure. Delta Cross Channel gates are assumed to be closed during December 15 through January 31. February 1 through June 15, Delta Cross Channel gates are operated based on D-1641 requirements.
Suisun Marsh Salinity Control Gates	<ul style="list-style-type: none"> No change. Gates would continue to be closed up to 20 days per year from October through May. 	
Export to inflow ratio	<ul style="list-style-type: none"> No change. Operation criteria are the same as defined under D-1641. The D-1641 export/inflow (E/I) ratio calculation was designed to protect fish from south Delta entrainment. For Alternative 4A, Reclamation and DWR propose that the NDD does not affect either Delta inflows or exports as they relate to the E/I ratio calculation. In other words, 	<ul style="list-style-type: none"> <u>Combined export rate is defined as the diversion rate of the Banks Pumping Plant and Jones Pumping Plant from the south Delta channels.</u> <u>Delta inflow is defined as the</u>

Parameter	Criteria	Summary of CALSIM Modeling ^a
	<p><u>Sacramento River inflow is defined as flows downstream of the NDD and only south Delta exports are included for the export component of the criteria. Combined export rate is defined as the diversion rate of the Banks Pumping Plant and Jones Pumping Plant from the south Delta channels.</u></p> <ul style="list-style-type: none"> • <u>Delta inflow is defined as the sum of the Sacramento River flow downstream of the proposed north Delta diversion intakes, Yolo Bypass flow, Mokelumne River flow, Cosumnes River flow, Calaveras River flow, San Joaquin River flow at Vernalis, and other miscellaneous in-Delta flows.</u> 	<p><u>sum of the Sacramento River flow downstream of the proposed north Delta diversion intakes, Yolo Bypass flow, Mokelumne River flow, Cosumnes River flow, Calaveras River flow, San Joaquin River flow at Vernalis, and other miscellaneous in-Delta flows. Same as CM1 criteria.</u></p>

^a See Table C.A-1, CALSIM II Modeling Assumptions for Existing Conditions (EBC1), No Action Alternative (EBC2) and BDCP Operational Scenarios, in Draft BDCP Attachment 5.C.A. in Appendix 5.C, Flow, Passage, Salinity, and Turbidity, Attachment 5.C.A. of the Draft BDCP Section B.3.4, Alternative 4 Decision Tree Scenarios H1, H2, H3 and H4, in Appendix 5A, Modeling Technical Appendix, of the Draft EIR/EIS.

Application of Flow Criteria

Flow criteria are applied seasonally (month by month) and according to the following five water-year types. Under the observed hydrologic conditions over the 82-year period (1922–2003), the number of years of each water-year type is included below. The water-year type classification for the majority of the criteria mentioned here, unless noted differently, is based on the Sacramento Valley 40-30-30 Water Year Index defined under D-1641.

- Wet water year: the wettest 26 years of the 82-year hydrologic data record, or 32% of years.
- Above-normal water year: 12 years of 82, or 15%.
- Below-normal water year: 14 years of 82, or 17%.
- Dry water year: 18 years of 82, or 22%.
- Critical water year: 12 years of 82, or 15%.

Water operations under the proposed action Alternative 4A are then constrained as shown in Table 4.1-2.

Proposed New Flow Criteria for North Delta SWP and CVP Export Facilities

Diversions at the north Delta from the north intake would be greatest in wetter years and lowest in drier years, when south Delta diversions would provide the majority of the CVP and SWP south of Delta exports. This is a result of In order to avoid impacts to listed species, north Delta bypass flow requirements were developed in coordination with the fisheries agencies, and are, described below. Additionally, Alternative 4A operations include a preference for south Delta pumping in July through September to provide limited flushing for improving general avoid water quality conditions and reduced residence times degradation in the south Delta.

The objectives of the north Delta diversion bypass flow criteria include regulation of flows to (1) maintain fish screen sweeping velocities; (2) reduce upstream transport from downstream channels in the channels downstream of the intakes; (3) support salmonid and pelagic fish transport and

migration to regions of suitable habitat; (4) reduce losses to predation effects downstream of the diversions; and (5) maintain or improve rearing habitat conditions in the north Delta.

To ensure that these objectives are met, diversions must be restricted at certain times of the year (~~more severely~~ mostly from December through June) when juvenile covered fish species are present. This is achieved by restricting the diversion to low level pumping when the juvenile fish begin their outmigration, which generally coincides with during the seasonal high flows triggered by fall/that coincide with the start of the winter rains (called pulse flows), when the juvenile fish begin their outmigration; followed by providing adequate flows during the remainder of the outmigration (called post-pulse operations). ~~A process of determining when the pulse occurs is described below.~~ The protections allowed during these pulses are intended to will achieve safe juvenile passage past the intakes to well downstream of lower Delta channels that might otherwise lead them away from ~~the lower estuary~~ their primary migration route. Additional but less restrictive requirements apply for the late spring to late fall period. The north Delta diversion bypass flow criteria comprise ~~three~~ parameterstwo components that are applied to the Sacramento River: (1) low-level pumping; (2) initial pulse protection; and (23) three levels of post-pulse operations. These ~~parameters~~ components are summarized below. A third component termed as "low-level pumping" allows diversion of 6% of Sacramento River flow measured upstream of the intakes up to 900 cfs (300 cfs per intake) year-round as long as Sacramento River downstream of the intakes is at least 5,000 cfs.

The initial pulse of juvenile fish migration is a natural occurrence caused by the first substantial runoff event of the season. This can occur as early as October or as late as February, but usually happens in December or January. During the initial pulse, flows will be diminished only by ~~constant~~ low-level pumping to the extent allowed under the rules described below. If the initial pulse occurs prior to Dec 1, then an assessment will be made to decide when a second pulse is necessary to be protected similar to the first pulsewhen a second pulse is necessary. A flow condition will be categorized as an initial pulse based on real-time monitoring of flow at Wilkins Slough and juvenile fish movement. The definition of the initial pulse for the purposes of modeling is provided below.

At the end of the initial pulse phase, post-pulse operations will apply, with potential adjustments made based on real-time operations as described in Table 4.1-2. The conditions that trigger the transition from the initial pulse protection to post-pulse operations are described below, along with bypass operating rules for the post-pulse phase, which provide maximum allowable levels of diversion for a given Sacramento River inflow measured upstream of the intakesfor restricted levels of pumping. Additionally, as described in Table 4.1-2, there will be biologically-based triggers to allow for transitioning between and among the different pumping diversion levels.

In July through September, the bypass rules are less restrictive, allowing for a greater proportion of the Sacramento River to be diverted, as described in Table 4.1-2. In October through November the bypass amount is increased from 5,000 cfs to 7,000 cfs, allowing a smaller proportion of the Sacramento River to be diverted.

Proposed New Flow Criteria for CVP and SWP South Delta Export Facilities

The objectives of the south Delta flow criteria are to minimize take at south Delta pumps by reducing incidence and magnitude of reverse flows during critical periods for fish species. The south Delta channel flow criteria are based on the parameters for Old and Middle River (OMR) flows and the south Delta Export-to-Inflow (E/I) ratio, as summarized below, and Head of Old River Barrier operations. Additionally, ~~the proposed action~~ Alternative 4A operations include a preference for south Delta pumping in July through September to provide limited flushing ~~for improving general~~

~~water quality conditions and reduced residence times or avoid water quality degradation in the south Delta.~~

OMR Flows

The OMR flow criteria chiefly serve to constrain the magnitude of reverse flows in the Old and Middle Rivers for entrainment protection and minimization of adverse indirect effects. The criteria are derived from fish protection triggers described in the USFWS (2008) and NMFS (2009) BiOps RPA Actions, and are described in Table 4.1-2. The proposed OMR flow criteria is used to constrain the south Delta exports, if the OMR flow requirements under current BiOps are not as constraining as the proposed criteria. These newly proposed OMR criteria (and associated Head of Old River Barrier operations) are in response to expected changes under Alternative 4A, and only applicable after the proposed north Delta diversion becomes operational.

In April, May, and June, OMR minimum allowable values would be based upon the San Joaquin River inflow relationship to OMR (Table 4.1-2). In October and November, OMR and south Delta export restrictions are based upon State Water Board D-1641 pulse trigger, as follows.¹⁸

- Two weeks Before State Water Board D-1641 pulse trigger: no OMR restrictions.
- During State Water Board D-1641 pulse trigger: no south Delta exports.
- Two weeks Following State Water Board D-1641 pulse trigger: OMR operated up to be no more negative than -5,000 cfs through November.

Additionally, new criteria based on the water year type in December through March would be implemented as described in detail in Table 4.1-2. The new criteria is generally more constraining under the wetter years compared to the requirements under the current BiOps.

Operations of the New Head of Old River Operable Barrier

Operations for the Head of Old River gate would be managed as follows.

- **October 1 – November 30:** RTO management and HORB will be closed in order to protect the D-1641 pulse flow designed to attract upstream migrating adults.
- **January:** When salmon fry are migrating (determined based on real time monitoring), initial operating criterion will be to close the gate subject to RTO for purposes of water quality, stage, and flood control considerations.
- **February – June 15:** The gate will be closed, but subject to RTO for purposes of water quality, stage, and flood control considerations. The agencies will actively explore the implementation of reliable juvenile salmonid tracking technology which may enable shifting to a more flexible real time operating criterion based on the presence/absence of covered fishes.
- **June 16 to September 30, December:** Operable gates will be open.

Real-Time Operational Decision-Making Process

RTO Team decisions are expected to be needed during at least some part of the year at the Head of Old River gate and the north and south Delta diversion facilities. The RTO Team in making

¹⁸ For the purposes of modeling, it was assumed that the D-1641 pulse in San Joaquin River occurs in the last 2 weeks of October.

operational decisions that depart from the criteria used in the modeling will take into account upstream operational constraints, such as coldwater pool management, instream flow, and temperature requirements. The extent to which real time adjustments that may be made to each parameter related to these facilities shall be limited by the criteria and/or ranges is set out in Table 4.1-2. That is, operational adjustments shall be consistent with the criteria, and within any ranges, established in the Conservation Measures. Any modifications to the parameters subject to real time operational adjustments or to the criteria and/or ranges set out in Table 4.1-2 shall occur only through the adaptive management, as discussed below.

Head of Old River gate. Operations for the Head of Old River gate would be managed under Real Time Operations (RTOs) as follows: set forth in Table 4.1-2.

- ~~● October 1–November 30th: RTO management in order to protect the D-1641 pulse flow designed to attract upstream migrating adults.~~
- ~~● February–June 15th: The gate will be closed, but subject to RTO for purposes of water quality, stage, and flood control considerations. The agencies will actively explore the implementation of reliable juvenile salmonid tracking technology which may enable shifting to a more flexible real time operating criterion based on the presence/absence of covered fishes.~~
- ~~● June 16 to September 30, December: Operable gates will be open.~~

North Delta diversions. Operations for North Delta bypass flows will be managed according to the following criteria: described in Table 4.1-2. Additional biologically-based triggers for adjustments between and among Levels I, II, and III, are under development through the ESA consultation process.

- ~~● October, November: Flows will exceed 7,000 cfs.~~
- ~~● July, August, September: Flows will exceed 5,000 cfs.~~
- ~~● December through June: Post-pulse bypass flow operations will not exceed Level 1 pumping unless specific criteria have been met to increase to level 2 or level 3. If those criteria are met, operations can proceed as defined in Draft BDCP Table 3-2¹⁹. The specific criteria for transitioning between and among pulse protection, Level 1, Level 2, and/or Level 3 operations, will be developed and based on real-time fish monitoring and hydrologic/behavioral cues upstream of and in the Delta. During operations, adjustments are expected to be made to improve water supply and/or migratory conditions for fish by making real-time adjustments to the pumping levels at the north Delta diversions. These adjustments would be managed under RTOs.~~

South Delta diversions. The south Delta diversions will be managed under RTO to achieve OMR criteria, throughout the year based on fish protection triggers (e.g., salvage density, calendar, species distribution, entrainment risk, turbidity, and flow based triggers). Increased restrictions as well as relaxations of the OMR criteria may occur as a result of observed physical and biological information. Additionally, as described above for the north Delta diversions, RTO would also be managed to distribute pumping activities amongst the three north Delta and two south Delta intake facilities to maximize both survival of covered fish species in the Delta and water supply.

¹⁹ Reference from BDCP Public draft

Timing for Implementation of Operations

Implementation of ~~the proposed action~~ Alternative 4A will include operations of both new and existing water conveyance facilities as described above and in Table 4.1-2, once the new north Delta facilities are ~~completed~~ constructed and become operational, thereby enabling joint ~~management operations~~ of north and south Delta diversions. Until that time, operations will be governed by existing and applicable requirements and standards included in the NMFS (2009) and FWS (2008) BiOps and D-1641, as may be amended, and any ~~other regulations that supersede those requirements~~ regulatory and contractual obligations.

4.1.2.3 Environmental Commitments

To achieve the applicable regulatory standards under ESA Section 7 and CESA Section 2081(b) while also complying with NEPA and CEQA, a subset of those activities previously proposed in the conservation strategy for the Draft BDCP would be implemented under Alternative 4A. Specifically, portions of the actions previously contemplated under CM3, CM4, CM6, CM7, CM8, CM9, CM10, CM11, CM12, CM15, and CM16 would be included in Alternative 4A. As preserved within Alternative 4A, ~~However, because they may not be considered~~ these activities are no longer “conservation measures.” The reason for not using this familiar term is to avoid creating confusion regarding the legal basis for preserving these activities within Alternative 4A. The term “conservation measure” is generally used as a term of art under the ESA. It is related to the requirement under Section 10(a)(2) of the Act that a proposed “habitat conservation plan” (HCP) include “measures ... necessary or appropriate for purposes of” the HCP. The Section 7 Handbook of the United States Fish and Wildlife Service describes “conservation measures” as “actions pledged in the project description that the action agency or the applicant will implement to further the recovery of the species under review.” These actions “serve to minimize or compensate for, project effects on the species under review. These may include actions taken prior to the initiation of consultation, or actions which the Federal agency or applicant have committed to complete in a biological assessment or similar document.”

Lacking a proposed HCP, Alternative 4A does not include components meeting this legal description under ESA, which is linked to Section 10 of the Act, relating to HCPs. Instead, under Alternative 4A, includes the above-described subset of previously-proposed conservation measures primarily in order to satisfy the CEQA obligation to mitigate significant environmental effects to the extent feasible. These repackaged and limited elements of the original BDCP Conservation Measures they are instead referred to as “Environmental commitments-Commitments.” As noted, these Environmental Commitments are primarily intended to satisfy CEQA, though they also frequently serve the purposes of CESA Section 2081 and ESA Section 7. To minimize confusion, they are numbered to track the parallel BDCP Conservation Measures with the same numbers: Environmental Commitments 3, 4, 6, 7, 8, 9, 10, 11, 12, 15, and 16, as summarized in Table 4.1-3. These commitments consist primarily of habitat restoration, protection, enhancement, and management activities necessary to ~~offset—offset—that is, mitigate for—~~ adverse effects from construction of the proposed water conveyance facilities, along with species-specific performance standards to ensure that implementation of these commitments would achieve the intended mitigation of impacts (for a list of these standards, along with species-specific mitigation needs, see Table 4.1-84).²⁰ Where impact statements or mitigation measures refer to Conservation Measures, these statements have been changed in the analysis for Alternative 4A to refer instead to the parallel Environmental

²⁰ While these are distinct from the environmental commitments described in Appendix 3B, *Environmental Commitments*, of the Draft EIR/EIS, both sets of commitments would apply to implementation of Alternative 4A.

1 Commitments. Additionally, pertinent elements previously included as Avoidance and Minimization
 2 Measures and the proposed Adaptive Management and Monitoring Program would be implemented
 3 as applicable to the activities proposed under Alternative 4A. ²¹ These, too, would serve a mitigation
 4 function under CEQA. ~~In other words, a~~ All of these components would function as *de facto* CEQA and
 5 NEPA mitigation measures for the construction and operations-related impacts of Alternative 4A.
 6 Details regarding the implementation of these activities under Alternative 4A are provided below
 7 and in Table 4.1-3.

8 The RDEIR/SDEIS describes and analyzes Environmental Commitments 3, 4, 6, ~~7, 8, 9, 10, 11, 12,~~
 9 15, and 16 at a level of detail consistent with that applied to these activities under other alternatives
 10 in the Draft EIR/EIS. (See CEQA Guidelines, § 15126.4[a][1][D] [EIRs must discuss significant effects
 11 of mitigation measures, “but in less detail than the significant effects of the project as proposed”];
 12 see also *California Native Plant Society v. City of Rancho Cordova* (2009) 172 Cal.App.4th 603, 621-
 13 625 [lead agency did not violate CEQA by failing to identify the off-site location at which mitigation
 14 for impacts to on-site wetlands would be carried out].) Specific locations for implementing many of
 15 the activities associated with these commitments have not been identified at this time. Therefore,
 16 the analyses consider typical construction, operation, and maintenance activities that would be
 17 undertaken for implementation of the habitat restoration and enhancement and stressor reduction
 18 efforts. Where appropriate and necessary, implementation of individual projects associated with an
 19 environmental commitment would be subject to additional environmental review. (See CEQA
 20 Guidelines, §§ 15162 – 15164; 40 C.F.R. § 1502.9[c].)

21 Note that ~~those~~ many of the actions formerly part of the BDCP conservation strategy but not
 22 proposed to be implemented under Alternative 4A would continue to be pursued as part of existing
 23 but separate projects and programs associated with (1) the 2008 and 2009 USFWS and NMFS BiOps
 24 (e.g., Yolo Bypass improvements and habitat enhancements, 8,000 acres of tidal habitat restoration),
 25 and (2) California EcoRestore, and (3) the 2014 California Water Action Plan. Those actions are
 26 separate from, and independent of, Alternative 4A. Therefore, for the purposes of Alternative 4A,
 27 these elements (and their associated environmental effects) are considered either as part of the No
 28 Action Alternative, as described in Section 4.2, or as part of the cumulative impact analysis, as
 29 described in Section 5, *Revisions to Cumulative Impact Analyses*.

²¹ Specifically, AMMs 1-7, 10, 12-15, 18, 20-25, 30, and 37 would be carried forward under implementation of this alternative.

Table 4.1-3. Environmental Commitments under Alternative 4A

Environmental Commitment 3: Natural Communities Protection and Restoration	
Valley/Foothill Riparian	10325 acres
Grassland	1,0602,130 acres
Vernal Pool Complex and Alkali Seasonal Wetland Complex	150 acres
Nontidal Marsh	119 acres
Cultivated Lands	11,8700,064 acres
Total:	Up to 13,3022,587 acres
Environmental Commitment 4: Tidal Natural Communities Restoration	Up to 18259 acres
Environmental Commitment 6: Channel Margin Enhancement	Up to 4.6 levee miles
Environmental Commitment 7: Riparian Natural Community Restoration	Up to 25173 acres
<u>Environmental Commitment 8: Grassland Natural Community</u>	<u>Up to 1,070 acres</u>
Environmental Commitment 9: Vernal Pool and Alkali Seasonal Wetland Complex Restoration	Up to 34 acres
Environmental Commitment 10: Nontidal Marsh Restoration	Up to 832907 acres
Environmental Commitment 11: Natural Communities Enhancement and Management	At sites restored or protected or restored under Environmental Commitments 3-10
Environmental Commitment 12: Methylmercury Management	At sites restored under Environmental Commitment 4
Environmental Commitment 15: Localized Reduction of Predatory Fishes	At north Delta intakes and at Clifton Court Forebay
Environmental Commitment 16: Nonphysical Fish Barrier	At Georgiana Slough

Environmental Commitment 3: Natural Communities Protection and Restoration

This action would consist of the acquisition of lands for protection and restoration of listed species habitat in perpetuity and would be implemented in the same way as described in Conservation Measure 3 in the Draft BDCP but over less area. For the purposes of Alternative 4A, this action would entail protection of up to ~~12,58713,302~~ acres, of natural communities and cultivated land, as shown in Table 4.1-3. This protection and restoration would mitigate for the loss of terrestrial species habitat associated with construction of the water conveyance facilities.

Environmental Commitment 4: Tidal Natural Communities Restoration

This action would consist of the restoration of tidal natural communities and transitional uplands and would be implemented in the same way as described in Conservation Measure 4 in Appendix D, *Substantive BDCP Revisions, of this RDEIR/SDEIS*, but over less area. For the purposes of analysis of Alternative 4A, this action would entail restoration of up to ~~18259~~ acres (including transitional uplands), as shown in Table 4.1-3. This analysis assumes that none of these 18259 acres of tidal restoration will be done in the Suisun Marsh area. Tidal habitat restoration would mitigate for the physical loss of aquatic habitat associated with construction of the north Delta intake facilities. The current proposed mitigation ratio is 1:1 for a total of 59 acres. However, actual acreage may change based on further discussions with NMFS, USFWS, and DFW pertaining to the actual value of the current habitat and/or the appropriate ratio of mitigation. Based on initial discussions, the

maximum ratio applied to tidal wetland mitigation is 3:1, and therefore would not exceed 177 acres for this alternative.

Environmental Commitment 6: Channel Margin Enhancement

This action would consist of the enhancement of channel margin habitat and would be implemented in the same way as described in Conservation Measure 6 in the Draft BDCP but over less linear distance. For the purposes of Alternative 4A, this action would entail enhancement of up to 4.6 levee miles, as shown in Table 4.1-3. This would mitigate for the loss of salmonid habitat associated with construction of the north Delta intake facilities.

Environmental Commitment 7: Riparian Natural Community Restoration

This action would consist of the restoration of riparian natural communities and would be implemented in the same way as described in Conservation Measure 7 in the Draft BDCP but over less area. For the purposes of Alternative 4A, this action would entail restoration of up to ~~273~~ 251 acres, as shown in Table 4.1-3. This would mitigate for the loss of terrestrial species habitat associated with construction of the water conveyance facilities.

Environmental Commitment 8: Grassland Natural Community

This action would consist of the restoration of grassland natural communities habitat and would be implemented in the same way as described in Conservation Measure 8 in the Draft BDCP but over less area. For the purposes of Alternative 4A, this action would entail restoration of up to 1,070 acres as shown in Table 4.1-43. This would mitigate for the loss of terrestrial species habitat associated with construction of the water conveyance facilities.

Environmental Commitment 9: Vernal Pool and Alkali Seasonal Wetland Complex Restoration

This action would consist of the restoration of vernal pool and alkali seasonal wetland complex and would be implemented in the same way as described in Conservation Measure 9 in the Draft BDCP but over less area. For the purposes of Alternative 4A, this action would entail restoration of up to 34 total acres of vernal pool complex and/or alkali seasonal wetland complex, as shown in Table 4.1-3. This would mitigate for the loss of species habitat associated with construction of the water conveyance facilities.

Environmental Commitment 10: Nontidal Marsh Restoration

This action would consist of the restoration of nontidal marsh and would be implemented in the same way as described in Conservation Measure 10 in the Draft BDCP but over less area. For the purposes of Alternative 4A, this action would entail restoration of up to ~~907~~ 832 acres of nontidal marsh, as shown in Table 4.1-3. This would mitigate for the loss of species habitat associated with construction of the water conveyance facilities.

Environmental Commitment 11: Natural Communities Enhancement and Management

This action would apply to all protected and restored habitats under Alternative 4A and would be implemented, where applicable, to manage and enhance these lands consistent with the approach

described under Conservation Measure 11 in the Draft BDCP. These actions would support mitigation for the loss of terrestrial species habitat associated with construction of the water conveyance facilities.

Environmental Commitment 12: Methylmercury Management

This action would minimize conditions that promote production of methylmercury in restored tidal wetland areas and its subsequent introduction to the foodweb, and to listed species in particular. Implementation of this action would be consistent with the revised description of Conservation Measure 12 (see Appendix D, *Substantive BDCP Revisions, of this RDEIR/SDEIS*). The portions of the measure applicable to effects in the Yolo Bypass would not apply because Yolo Bypass improvements would not be implemented as part of this alternative.

Environmental Commitment 15: Localized Reduction of Predatory Fishes (Predator Control)

This action would reduce populations of predatory fishes at locations of high predation risk (i.e., predation hotspots) associated with construction and operation of the proposed water conveyance facilities. Implementation of this action would be consistent with the revised description of Conservation Measure 15 (see Appendix D, *Substantive BDCP Revisions, of this RDEIR/SDEIS*); however, for the purposes of Alternative 4A, this action would be applied only to the reach of the Sacramento River adjacent to the north Delta intakes and to Clifton Court Forebay. EC15 would remove predator refuge habitat and reduce predator abundance in the construction areas. At a minimum, EC15 will target the removal of an amount of predator refuge commensurate with the amount that may be created by construction of water conveyance facilities. These measures are expected to fully mitigate any indirect effect on predation rates associated with construction. This commitment would mitigate for effects on salmonid predation associated with operation of new conveyance facilities.

Environmental Commitment 16: Nonphysical Fish Barrier

This action would be implemented to address effects related to survival of outmigrating juvenile salmonids by installing a nonphysical barrier at Georgiana Slough to redirect fish away from channels and river reaches in which survival is lower than in alternate routes. Implementation of this action would be consistent with the revised description of Conservation Measure 16 (see Appendix D, *Substantive BDCP Revisions, of this RDEIR/SDEIS*); however, for the purposes of Alternative 4A, this action would be applied only to Georgiana Slough. This commitment would mitigate for effects on salmonid survival associated with operation of north Delta intakes and associated flows.

Avoidance and Minimization Measures

~~These Actions~~ associated with AMMs 1-7, 10, 12-15, 18, 20-25, 30, and 37 would apply to all construction activities under Alternative 4A and would be implemented, where applicable, to avoid and minimize impacts on listed species, consistent with the approach described in Appendix 3.C, *Avoidance and Minimization Measures, in of the Draft BDCP, and in Appendix D of this RDEIR/SDEIS*. These actions would minimize the risk of impacts ~~to on~~ species resulting from construction activities.

Adaptive Management and Monitoring Program

As a component of Alternative 4A, an adaptive management and monitoring program (AMMP) would be implemented to use new information and insight gained during the course of construction and operation of water conveyance facilities to ensure that the proposed project continues to meet applicable ESA Section 7 and CESA Section 2081(b) standards. Monitoring and research conducted under this AMMP and other programs will provide insights into changes in Delta conditions that result from climate change (e.g., sea level rise, changing hydrology in the Delta watershed, increased water temperatures); seismic events; land uses; and other factors. Extensive monitoring and research are currently underway in the Delta. To address the specific requirements of Alternative 4A, some of these existing monitoring activities will continue and, in some cases, be expanded. In other cases, existing monitoring activities will be modified to reflect specific implementation needs of the project. Information obtained from monitoring and research activities will be used by decision makers to improve the effectiveness of the conservation measures toward advancing the biological goals and objectives. For the purposes of analysis, it is assumed that the AMMP developed for Alternative 4A would not, by itself, create nor contribute to any new significant environmental effects; instead, the AMMP would influence the operation and management of facilities and protected or restored habitat associated with Alternative 4A. In the unlikely event that the AMMP suggests the need for changes in operation or new construction not addressed in this EIR/EIS, supplemental environmental review may be necessary under CEQA and NEPA. (See CEQA Guidelines, §§ 15162 – 15164; 40 C.F.R. § 1502.9[c].)

4.1.3 Description of Alternative 2D

4.1.3.1 Water Conveyance Facility Construction and Maintenance

Under Alternative 2D, water conveyance facilities would be constructed and maintained similarly to those proposed and analyzed under Alternative 4 (including the modifications described in Section 3, *Alternative 4: Conveyance Facility Modifications*, of this RDEIS/SDEIS); however, this alternative would entail five intakes in the same locations as those under Alternative 2A (as shown in Figure 3-2 of the Draft EIR/EIS), rather than three. Water would primarily be conveyed from the north Delta to the south Delta through pipelines and tunnels. Water would be diverted from the Sacramento River through five fish-screened intakes on the east bank of the Sacramento River between Freeport and Courtland (Intakes 1–5) and would be conveyed to a sedimentation basin before reaching the tunnels. From the intakes, water would flow into an initial single-bore tunnel, which would lead to an intermediate forebay on Glannvale Tract. From the southern end of this forebay, water would pass through an outlet structure into a dual-bore tunnel where it would flow by gravity to the south Delta. Water would then reach pumping plants northeast of the Clifton Court Forebay, where it would be pumped from the tunnels into the north cell of the expanded Clifton Court Forebay. The forebay would be dredged and redesigned to provide an area that would isolate water flowing from the new north Delta facilities from water diverted from south Delta channels.

Table 4.1-4. Comparison of Alternatives 4, 2A and Alternative 2D

Element of Project Description	Alternative 4 (BDCP)	Alternative 2A	Alternative 2D
ESA Compliance	<u>Section 10</u>	Section 10	Section 7
CESA Compliance	<u>NCCP</u>	NCCP	2081(b) permit
Facilities	<u>Modified Pipeline/Tunnel Alignment: 3 intakes, 9,000 cfs</u>	Pipeline/Tunnel Alignment: 5 intakes, 15,000 cfs	Modified Pipeline/Tunnel Alignment: 5 intakes, 15,000 cfs
Operations	<u>Dual Conveyance; Operational Scenarios H1-H4 with Decision Tree (see Chapter 3, Section 3.6.4.2 of the Draft EIR/EIS); evaluated at LLT</u>	Dual Conveyance; Operational Scenario B (see Chapter 3, Section 3.6.4.2 of the Draft EIR/EIS); evaluated at LLT	Dual Conveyance; Operational Scenario B without Fremont Weir modifications; evaluated at ELT
Conservation Measures/Environmental Commitments	<u>Conservation Measures 2-21; includes Yolo Bypass Improvements and 65,000 acres of tidal wetland restoration</u>	Conservation Measures 2-21; includes Yolo Bypass Improvements and 65,000 acres of tidal wetland restoration	Environmental Commitments 3, 4, 6, 7, 8, 9, 10, 11, 12, 15, 16; includes up to 213,65 acres of tidal wetland restoration
CEQA Baseline	<u>Existing Conditions</u>	Existing Conditions	Existing Conditions
NEPA Baseline	<u>No Action Alternative at LLT</u>	No Action Alternative at LLT	No Action Alternative at ELT

A map and a schematic diagram depicting the conveyance facilities associated with the modified pipeline/tunnel alignment are provided in Mapbook Figure M3-4 in the Mapbook Volume and Figure 3-10 in Appendix A of this RDEIR/SDEIS (note, however, that these figures depict three intake locations, rather than five). Each additional intake site would also require associated ancillary facilities and features, including box conduits under a widened and raised levee section, a relocated segment of State Route (SR) 160, sedimentation basins, drying lagoons, an outlet shaft, and an elevated pad hosting an electrical substation, an electrical building, and other storage buildings. During construction it is assumed that a temporary work area would surround each permanent intake site and would include a fuel station and concrete batch plant. Construction of Intake 1 would also require an additional segment of single-bore tunnel (connecting Intakes 1 and 2), as well as an expanded reusable tunnel material (RTM) area to accommodate the material associated with this tunnel. Similarly, an extension of the proposed temporary 69kV power line would be required to connect to Intake 1 during construction.

As proposed for Alternative 4, a new pumping facility would be constructed northeast of the north cell of the expanded Clifton Court Forebay, along with control structures to regulate the relative quantities of water flowing from the north Delta and the south Delta to the Banks and Jones Pumping Plants. Alternative 2D would entail the continued use of the SWP/CVP south Delta export facilities.

All other aspects of water conveyance facility design, construction, and maintenance would be similar to those described for Alternative 4 in the revised text in Chapter 3, Sections 3.4, 3.5.9, and 3.6.1 and Appendix 3C, as provided in Appendix A, *Revisions to the Draft EIR/EIS*, of this RDEIR/SDEIS.

4.1.3.2 Water Conveyance Facility Operations

Operational components of the water conveyance facilities under Alternative 2D would be similar, but not identical, to those described under Scenario B in Chapter 3, Section 3.6.4.2 of the Draft EIR/EIS. Operational elements associated with Fremont Weir modifications would not be incorporated as part of this alternative, because Yolo Bypass improvements previously contemplated for Alternative 2A (under CM2 of the Draft BDCP) would not be implemented as part of Alternative 2D; instead, they would be assumed to occur as part of the No Action Alternative because they are required by the existing BiOps. For a detailed characterization of operational criteria, please refer to Chapter 3, Section 3.6.4.2 of the Draft EIR/EIS.²²

Implementation of Alternative 2D would include operations of both new and existing water conveyance facilities once the new north Delta facilities are completed and become operational, thereby enabling joint management of north and south Delta diversions. Operations included in this alternative for south Delta export facilities would replace the south Delta operations currently implemented in compliance with the FWS (2008) and NMFS (2009) BiOps. The north Delta intakes and the head of Old River barrier would be new facilities for the SWP and CVP and would be operated as described in Chapter 3, Section 3.6.4.2 of the Draft EIR/EIS. The design of the HORB is not yet complete, and should design change substantially from what is assumed in this RDEIR/SDEIS, such that there is a potential for new effects, additional CEQA and/or NEPA review would be required. Compliance with all other criteria included in the FWS (2008) and NMFS (2009) BiOps and State Water Resources Control Board Water Right Decision 1641 (D-1641), including Fall X2, the E:I ratio, and operations of the Delta Cross Channel gates and the Suisun Marsh Salinity Control Gates, will continue as part of the continued operations of the CVP and SWP. As such, when compared to operations under the No Action Alternative, Alternative 2D includes modified or new operations and criteria of only the following elements.

- North Delta intake facilities.
- South Delta export operations.
- Head of Old River barrier operations.
- Rio Vista minimum flow standard in January through August.

Alternative 2D operations include a preference for south Delta pumping in July through September to provide limited flushing for improving general water quality conditions and reduced residence times.

Real-Time Operational Decision-Making Process

RTOs are expected to be needed during at least some part of the year at the Head of Old River gate and the north and south Delta diversion facilities. In making operational decisions, the RTO Team will take into account upstream operational constraints such as coldwater pool management, instream flow, and temperature requirements. The extent to which real time adjustments that may be made to each parameter related to these facilities shall be limited by the criteria and/or ranges is set out in Table 4.1-2 of this RDEIR/SDEIS. Any modifications to the parameters subject to real time

²² Note that these proposed operational criteria would only take effect after the proposed conveyance facilities are operational. Until that time, operations would occur as described in the USFWS 2008 and NMFS 2009 BiOps or as modified by the outcome of ongoing ESA compliance processes pertaining to operation of the existing facilities.

operational adjustments or to the criteria and/or ranges set out in Table 4.1-2 shall occur only through the adaptive management.

Head of Old River gate. Operations for the Head of Old River gate would be managed under RTOs as set forth in Table 4.1-2.

North Delta diversions. Operations for North Delta bypass flows will be managed according to the criteria described in Table 4.1-2.

South Delta diversions. The south Delta diversions will be managed under RTO to achieve OMR criteria, throughout the year based on fish protection triggers (e.g., salvage density, calendar, species distribution, entrainment risk, turbidity, and flow based triggers). Increased restrictions as well as relaxations of the OMR criteria may occur as a result of observed physical and biological information. Additionally, as described above for the north Delta diversions, RTO would also be managed to distribute pumping activities amongst the three north Delta and two south Delta intake facilities to maximize both survival of covered fish species in the Delta and water supply.

Timing for Implementation of Operations

Implementation of Alternative 2D would include operations of both new and existing water conveyance facilities as described above, once the new north Delta facilities are completed and become operational, thereby enabling joint management of north and south Delta diversions. Until that time, operations will be governed by existing and applicable requirements and standards included in the NMFS (2009) and FWS (2008) BiOps and D-1641, and any regulations that supersede those requirements.

4.1.3.3 Environmental Commitments

To achieve the applicable regulatory standards under ESA Section 7 and CESA Section 2081(b) while also complying with NEPA and CEQA, a subset of those activities previously proposed in Alternative 2A would be implemented under Alternative 2D. Specifically, portions of the actions previously contemplated under CM3, CM4, CM6, CM7, CM8, CM9, CM10, CM11, CM12, CM15, and CM16 would be included in Alternative 2D.

As described in Section 4.1.2.3 for Alternative 4A, these repackaged and limited elements of the original BDCP Conservation Measures are instead referred to as “Environmental Commitments” for the purposes of Alternative 2D: Environmental Commitments 3, 4, 6, 7, 8, 9, 10, 11, 12, 15, and 16, as summarized in Table 4.1-5 of this RDEIR/SDEIS. These commitments consist primarily of habitat restoration, protection, enhancement, and management activities necessary to offset—that is, mitigate for—adverse effects from construction of the proposed water conveyance facilities, along with species-specific performance standards to ensure that implementation of these commitments would achieve the intended mitigation of impacts (for a list of these standards, along with species-specific mitigation needs, see Table 4.1-8 of this RDEIR/SDEIS).²³ Where impact statements or mitigation measures refer to Conservation Measures, these statements have been changed in the analysis for Alternative 2D to refer instead to the parallel Environmental Commitments. Additionally, pertinent elements previously included as Avoidance and Minimization Measures and the proposed Adaptive Management and Monitoring Program would be implemented as applicable

²³ While these are distinct from the environmental commitments described in Appendix 3B, *Environmental Commitments*, of the Draft EIR/EIS, both sets of commitments would apply to implementation of Alternative 2D.

1 to the activities proposed under Alternative 2D.²⁴ These, too, would serve a mitigation function
 2 under CEQA. ~~In other words, a~~All of these components would function as *de facto* CEQA and NEPA
 3 mitigation measures for the construction and operations-related impacts of Alternative 2D. Details
 4 regarding the implementation of these activities under Alternative 2D are provided below and in
 5 Table 4.1-5 of this RDEIR/SDEIS.

6 The RDEIR/SDEIS describes and analyzes Environmental Commitments 3, 4, 6, 7, 8, 9, 10, 11, 12, 15,
 7 and 16 at a level of detail consistent with that applied to these activities under other alternatives in
 8 the Draft EIR/EIS. (See CEQA Guidelines, § 15126.4[a][1][D] [EIRs must discuss significant effects of
 9 mitigation measures, “but in less detail than the significant effects of the project as proposed”]; see
 10 also *California Native Plant Society v. City of Rancho Cordova* (2009) 172 Cal.App.4th 603, 621-625
 11 [lead agency did not violate CEQA by failing to identify the off-site location at which mitigation for
 12 impacts to on-site wetlands would be carried out].) Specific locations for implementing many of the
 13 activities associated with these commitments have not been identified at this time. Therefore, the
 14 analyses consider typical construction, operation, and maintenance activities that would be
 15 undertaken for implementation of the habitat restoration and enhancement and stressor reduction
 16 efforts. Where appropriate and necessary, implementation of individual projects associated with an
 17 environmental commitment would be subject to additional environmental review. (See CEQA
 18 Guidelines, §§ 15162 – 15164; 40 C.F.R. § 1502.9[c].)

19 Note that many of the actions formerly part of Alternative 2A but not proposed to be implemented
 20 under Alternative 2D would continue to be pursued as part of existing but separate projects and
 21 programs associated with (1) the 2008 and 2009 USFWS and NMFS BiOps (e.g., Yolo Bypass
 22 improvements, 8,000 acres of tidal habitat restoration) and (2) the 2014 California Water Action
 23 Plan. Those actions are separate from, and independent of, Alternative 2D. Therefore, for the
 24 purposes of Alternative 2D, these elements (and their associated environmental effects) are
 25 considered either as part of the No Action Alternative, as described in Section 4.2, or as part of the
 26 cumulative impact analysis, as described in Section 5, *Revisions to Cumulative Impact Analyses*.

²⁴ Specifically, AMMs 1–7, 10, 12–15, 18, 20–25, 30, and 37 would be carried forward under implementation of this alternative.

Table 4.1-5. Environmental Commitments under Alternative 2D

<u>Environmental Commitment 3: Natural Communities Protection and Restoration</u>	
Valley/Foothill R Riparian	122 9 acres
Grassland	1,089 2,155 acres
Vernal Pool Complex and Alkali Seasonal Wetland Complex	150 acres
Nontidal Marsh	187 19 acres
Cultivated Lands	13,410 0,451 acres
Total:	Up to 14,9583,003 acres
Environmental Commitment 4: Tidal Natural Communities Restoration	Up to 65 213 acres
Environmental Commitment 6: Channel Margin Enhancement	Up to 5.5 levee miles
Environmental Commitment 7: Riparian Natural Community Restoration	Up to 297 82 acres
<u>Environmental Commitment 8: Grassland Natural Community</u>	<u>Up to 1,099 acres</u>
Environmental Commitment 9: Vernal Pool and Alkali Seasonal Wetland Complex Restoration	Up to 34 acres
Environmental Commitment 10: Nontidal Marsh Restoration	Up to 1,307 055 acres
Environmental Commitment 11: Natural Communities Enhancement and Management	At sites restored or protected or restored under Environmental Commitments 3-10
Environmental Commitment 12: Methylmercury Management	At sites restored under Environmental Commitment 4
Environmental Commitment 15: Localized Reduction of Predatory Fishes	At north Delta intakes and at Clifton Court Forebay
Environmental Commitment 16: Nonphysical Fish Barrier	At Georgiana Slough

Environmental Commitment 3: Natural Communities Protection and Restoration

This action would consist of the acquisition of lands for protection and restoration of listed species habitat in perpetuity and would be implemented in the same way as described in Conservation Measure 3 in the Draft BDCP but over less area. For the purposes of Alternative 2D, this action would entail protection of up to 13,003~~14,958~~ acres, of natural communities and cultivated land, as shown in Table 4.1-5. This protection and restoration would mitigate for the loss of terrestrial species habitat associated with construction of the water conveyance facilities.

Environmental Commitment 4: Tidal Natural Communities Restoration

This action would consist of the restoration of tidal natural communities and transitional uplands and would be implemented in the same way as described in Conservation Measure 4 in Appendix D, *Substantive BDCP Revisions*, of this RDEIR/SDEIS, but over less area. For the purposes of analysis of Alternative 2D, this action would entail restoration of up to 213~~65~~ acres (including transitional uplands), as shown in Table 4.1-5. This analysis assumes that none of these 213~~65~~ acres of tidal restoration will be done in the Suisun Marsh area. Tidal habitat restoration would mitigate for the physical loss of aquatic habitat associated with construction of the north Delta intake facilities. The current proposed mitigation ratio is 1:1 for a total of 65 acres. However, actual acreage may change based on further discussions with NMFS, USFWS, and DFW pertaining to the actual value of the current habitat and/or the appropriate ratio of mitigation. Based on initial discussions, the

maximum ratio applied to tidal wetland mitigation is 3:1, and therefore would not exceed 195 acres for this alternative.

Environmental Commitment 6: Channel Margin Enhancement

This action would consist of the enhancement of channel margin habitat and would be implemented in the same way as described in Conservation Measure 6 in the Draft BDCP but over less linear distance. For the purposes of Alternative 2D, this action would entail enhancement of up to 5.5 levee miles, as shown in Table 4.1-5. This would mitigate for the loss of salmonid habitat associated with construction of the north Delta intake facilities.

Environmental Commitment 7: Riparian Natural Community Restoration

This action would consist of the restoration of riparian natural communities and would be implemented in the same way as described in Conservation Measure 7 in the Draft BDCP but over less area. For the purposes of Alternative 2D, this action would entail restoration of up to ~~282~~297 acres, as shown in Table 4.1-5. This would mitigate for the loss of terrestrial species habitat associated with construction of the water conveyance facilities.

Environmental Commitment 8: Grassland Natural Community

This action would consist of the restoration of grassland habitat and would be implemented in the same way as described in Conservation Measure 8 in the Draft BDCP but over less area. For the purposes of Alternative 2D, this action would entail restoration of up to 1,099 acres as shown in Table 4.1-5. This would mitigate for the loss of terrestrial species habitat associated with construction of the water conveyance facilities.

Environmental Commitment 9: Vernal Pool and Alkali Seasonal Wetland Complex Restoration

This action would consist of the restoration of vernal pool and alkali seasonal wetland complex and would be implemented in the same way as described in Conservation Measure 9 in the Draft BDCP but over less area. For the purposes of Alternative 2D, this action would entail restoration of up to 34 total acres of vernal pool complex and/or alkali seasonal wetland complex, as shown in Table 4.1-5. This would mitigate for the loss of species habitat associated with construction of the water conveyance facilities.

Environmental Commitment 10: Nontidal Marsh Restoration

This action would consist of the restoration of nontidal marsh and would be implemented in the same way as described in Conservation Measure 10 in the Draft BDCP but over less area. For the purposes of Alternative 2D, this action would entail restoration of up to ~~1,055~~1,307 acres of nontidal marsh, as shown in Table 4.1-5. This would mitigate for the loss of species habitat associated with construction of the water conveyance facilities.

Environmental Commitment 11: Natural Communities Enhancement and Management

This action would apply to all protected and restored habitats under Alternative 2D and would be implemented, where applicable, to manage and enhance these lands consistent with the approach

described under Conservation Measure 11 in the Draft BDCP. These actions would support mitigation for the loss of terrestrial species habitat associated with construction of the water conveyance facilities.

Environmental Commitment 12: Methylmercury Management

This action would minimize conditions that promote production of methylmercury in restored tidal wetland areas and its subsequent introduction to the foodweb, and to listed species in particular. Implementation of this action would be consistent with the revised description of Conservation Measure 12 (see Appendix D, *Substantive BDCP Revisions*, of this RDEIR/SDEIS). The portions of the measure applicable to effects in the Yolo Bypass would not apply because Yolo Bypass improvements would not be implemented as part of this alternative.

Environmental Commitment 15: Localized Reduction of Predatory Fishes (Predator Control)

This action would reduce populations of predatory fishes at locations of high predation risk (i.e., predation hotspots) associated with construction and operation of the proposed water conveyance facilities. Implementation of this action would be consistent with the revised description of Conservation Measure 15 (see Appendix D, *Substantive BDCP Revisions*, of this RDEIR/SDEIS); however, for the purposes of Alternative 2D, this action would be applied only to the reach of the Sacramento River adjacent to the north Delta intakes and to Clifton Court Forebay. This commitment would mitigate for effects on salmonid predation associated with operation of new conveyance facilities.

Environmental Commitment 16: Nonphysical Fish Barrier

This action would be implemented to address effects related to survival of outmigrating juvenile salmonids by installing a nonphysical barrier at Georgiana Slough to redirect fish away from channels and river reaches in which survival is lower than in alternate routes. Implementation of this action would be consistent with the revised description of Conservation Measure 16 (see Appendix D, *Substantive BDCP Revisions*, of this RDEIR/SDEIS); however, for the purposes of Alternative 2D, this action would be applied only to Georgiana Slough. This commitment would mitigate for effects on salmonid survival associated with operation of north Delta intakes and associated flows.

Avoidance and Minimization Measures

Actions associated with AMMs 1-7, 10, 12-15, 18, 20-25, 30, and 37 would apply to all construction activities under Alternative 2D and would be implemented, where applicable, to avoid and minimize impacts on listed species, consistent with the approach described in Appendix 3.C, *Avoidance and Minimization Measures*, of the Draft BDCP, and in Appendix D of this RDEIR/SDEIS. These actions would minimize the risk of impacts on species resulting from construction activities.

Adaptive Management and Monitoring Program

As a component of Alternative 2D, an adaptive management and monitoring program (AMMP) would be implemented to use new information and insight gained during the course of construction and operation of water conveyance facilities to ensure that the proposed project continues to meet applicable ESA Section 7 and CESA Section 2081(b) standards. Monitoring and research conducted

under this AMMP and other programs would provide insights into changes in Delta conditions that result from climate change (e.g., sea level rise, changing hydrology in the Delta watershed, increased water temperatures); seismic events; land uses; and other factors. Extensive monitoring and research are currently underway in the Delta. To address the specific requirements of Alternative 2D, some of these existing monitoring activities would continue and, in some cases, be expanded. In other cases, existing monitoring activities would be modified to reflect specific implementation needs of the project. Information obtained from monitoring and research activities will be used by decision makers to improve the effectiveness of the conservation measures toward advancing the biological goals and objectives. For the purposes of analysis, it is assumed that the AMMP developed for Alternative 2D would not, by itself, create nor contribute to any new significant environmental effects; instead, the AMMP would influence the operation and management of facilities and protected or restored habitat associated with Alternative 2D. In the unlikely event that the AMMP suggests the need for changes in operation or new construction not addressed in this EIR/EIS, supplemental environmental review may be necessary under CEQA and NEPA. (See CEQA Guidelines, §§ 15162 – 15164; 40 C.F.R. § 1502.9[c].)

4.1.4 Description of Alternative 5A

4.1.4.1 Water Conveyance Facility Construction and Maintenance

Under Alternative 5A, water conveyance facilities would be constructed and maintained similarly to those proposed and analyzed under Alternative 4 (including the modifications described in Section 3, *Alternative 4: Conveyance Facility Modifications*, of this RDEIR/SDEIS); however, this alternative would entail one intake in the same location as that under Alternative 5, rather than three. Water would be conveyed from the north Delta to the south Delta through pipelines and tunnels. Water would be diverted from the Sacramento River through one fish-screened intake on the east bank of the Sacramento River near Clarksburg (Intake 2). Water would travel from the intake to a sedimentation basin before reaching the tunnels. From the intake water would flow into an initial single-bore tunnel, which would lead to an intermediate forebay on Glannvale Tract. From the southern end of this forebay, water would pass through an outlet structure into a dual-bore tunnel where it would flow by gravity to the south Delta. Water would then reach pumping plants northeast of the Clifton Court Forebay, where it would be pumped from the tunnels into the north cell of the expanded Clifton Court Forebay. The forebay would be dredged and redesigned to provide an area that would isolate water flowing from the new north Delta facilities from water diverted from south Delta channels.

Table 4.1-6. Comparison of Alternatives 4, 5 and Alternative 5A

Element of Project Description	Alternative 4 (BDCP)	Alternative 5	Alternative 5A
ESA Compliance	<u>Section 10</u>	Section 10	Section 7
CESA Compliance	<u>NCCP</u>	NCCP	2081(b) permit
Facilities	<u>Modified Pipeline/Tunnel Alignment: 3 intakes, 9,000 cfs</u>	Pipeline/Tunnel Alignment: 1 intake, 3,000 cfs	Modified Pipeline/Tunnel Alignment: 1 intake, 3,000 cfs
Operations	<u>Dual Conveyance; Operational Scenarios H1–H4 with Decision Tree (see Chapter 3, Section 3.6.4.2 of the Draft EIR/EIS); evaluated at LLT</u>	Dual Conveyance; Operational Scenario C; evaluated at LLT	Dual Conveyance; Operational Scenario C without Fremont Weir modifications; evaluated at ELT
Conservation Measures/ Environmental Commitments	<u>Conservation Measures 2–21; includes Yolo Bypass Improvements and 65,000 acres of tidal wetland restoration</u>	Conservation Measures 2–21; includes Yolo Bypass Improvements and 65,000 acres of tidal wetland restoration	Environmental Commitments 3, 4, 6, 7, 8, 9, 10, 11, 12, 15, 16; includes up to 16455 acres of tidal wetland restoration
CEQA Baseline	<u>Existing Conditions</u>	Existing Conditions	Existing Conditions
NEPA Baseline	<u>No Action Alternative at LLT</u>	No Action Alternative at LLT	No Action Alternative at ELT

A map and a schematic diagram depicting the conveyance facilities associated with the modified pipeline/tunnel alignment are provided in Mapbook Figure M3-4 in the Mapbook Volume and Figure 3-10 in Appendix A of this RDEIR/SDEIS (note, however, that these figures depict three intake locations, rather than one). Construction of a single intake site (Intake 2) would preclude the need for ancillary facilities and features associated with Intakes 3 and 5, including box conduits under widened and raised levee sections, relocated segments of SR 160, sedimentation basins, drying lagoons, outlet shafts, and elevated pads hosting an electrical substation, an electrical building, and other storage buildings. During construction, temporary work areas, fuel stations, and concrete batch plants associated with Intakes 3 and 5 would also not be required. Similarly, Alternative 5A would not require construction of a single-bore tunnel between Intake 5 and the intermediate forebay, nor temporary 69kV power line segments connecting to substations at Intakes 3 or 5. Under Alternative 5A, an operable barrier would not be constructed at the head of Old River.

As proposed for Alternative 4, a new pumping facility would be constructed northeast of the north cell of the expanded Clifton Court Forebay, along with control structures to regulate the relative quantities of water flowing from the north Delta and the south Delta to the Banks and Jones Pumping Plants. Alternative 5A would entail the continued use of the SWP/CVP south Delta export facilities.

All other aspects of water conveyance facility design, construction, and maintenance would be similar to those described for Alternative 4 in the revised text in Chapter 3, Sections 3.4, 3.5.9, and 3.6.1 and Appendix 3C, as provided in Appendix A, *Revisions to the Draft EIR/EIS*, of this RDEIR/SDEIS.

4.1.4.2 Water Conveyance Facility Operations

Operational components of the water conveyance facilities under Alternative 5A would be similar, but not identical, to those described under Scenario C in Chapter 3, Section 3.6.4.2 of the Draft EIR/EIS. Operational elements associated with Fremont Weir modifications would not be incorporated as part of this alternative, because Yolo Bypass improvements previously contemplated for Alternative 5 (under CM2) would not be implemented as part of Alternative 5A; instead, they would be assumed to occur as part of the No Action Alternative because they are required by the existing BiOps. For a detailed characterization of operational criteria, please refer to Chapter 3, Section 3.6.4.2 of the Draft EIR/EIS.²⁵

Implementation of Alternative 5A would include operations of both new and existing water conveyance facilities once the new north Delta facilities are completed and become operational, thereby enabling joint management of north and south Delta diversions. The north Delta intake would be a new facility for the SWP and CVP and would be operated as described in Chapter 3, Section 3.6.4.2 of the Draft EIR/EIS. Compliance with all other criteria included in the FWS (2008) and NMFS (2009) BiOps and State Water Resources Control Board Water Right Decision 1641 (D-1641), including Fall X2, the E:I ratio, and operations of the Delta Cross Channel gates and the Suisun Marsh Salinity Control Gates, will continue as part of the operation of the CVP and SWP. As such, when compared with operations under the No Action Alternative, Alternative 5A includes modified or new operations and criteria of only the following elements.

- North Delta intake facilities.
- Rio Vista minimum flow standard in January through August.

Alternative 5A operations include a preference for south Delta pumping in July through September to provide limited flushing for improving general water quality conditions and reduced residence times.

Real-Time Operational Decision-Making Process

RTOs are expected to be needed during at least some part of the year at the north and south Delta diversion facilities. In making operational decisions, the RTO Team will take into account upstream operational constraints, such as coldwater pool management, instream flow, and temperature requirements. The extent to which real time adjustments that may be made to each parameter related to these facilities shall be limited by the criteria and/or ranges is set out in Table 4.1-2 of this RDEIR/SDEIS. Any modifications to the parameters subject to real time operational adjustments or to the criteria and/or ranges set out in Table 4.1-2 shall occur only through the adaptive management.

North Delta diversions. Operations for North Delta bypass flows will be managed according to the criteria described in Table 4.1-2.

South Delta diversions. The south Delta diversions will be managed under RTO to achieve OMR criteria, throughout the year based on fish protection triggers (e.g., salvage density, calendar, species distribution, entrainment risk, turbidity, and flow based triggers). Increased restrictions as well as

²⁵ Note that these proposed operational criteria would only take effect after the proposed conveyance facilities are operational. Until that time, operations would occur as described in the USFWS 2008 and NMFS 2009 BiOps or as modified by the outcome of ongoing ESA compliance processes pertaining to operation of the existing facilities.

relaxations of the OMR criteria may occur as a result of observed physical and biological information. Additionally, as described above for the north Delta diversions, RTO would also be managed to distribute pumping activities among the three north Delta and two south Delta intake facilities to maximize both survival of covered fish species in the Delta and water supply.

Timing for Implementation of Operations

Implementation of Alternative 5A would include operations of both new and existing water conveyance facilities as described above, once the new north Delta facilities are completed and become operational, thereby enabling joint management of north and south Delta diversions. Until that time, operations will be governed by existing and applicable requirements and standards included in the NMFS (2009) and FWS (2008) BiOps and D-1641, and any regulations that supersede those requirements.

4.1.4.3 Environmental Commitments

To achieve the applicable regulatory standards under ESA Section 7 and CESA Section 2081(b) while also complying with NEPA and CEQA, a subset of those activities previously proposed in Alternative 5 would be implemented under Alternative 5A. Specifically, portions of the actions previously contemplated under CM3, CM4, CM6, CM7, CM8, CM9, CM10, CM11, CM12, CM15, and CM16 would be included in Alternative 5A.

As described in Section 4.1.2.3 for Alternative 4A, these repackaged and limited elements of the original BDCP Conservation Measures are instead referred to as “Environmental Commitments” for the purposes of Alternative 5A: Environmental Commitments 3, 4, 6, 7, 8, 9, 10, 11, 12, 15, and 16, as summarized in Table 4.1-7. These commitments consist primarily of habitat restoration, protection, enhancement, and management activities necessary to offset—that is, mitigate for—adverse effects from construction of the proposed water conveyance facilities, along with species-specific performance standards to ensure that implementation of these commitments would achieve the intended mitigation of impacts (for a list of these standards, along with species-specific mitigation needs, see Table 4.1-8).²⁶ Where impact statements or mitigation measures refer to Conservation Measures, these statements have been changed in the analysis for Alternative 5A to refer instead to the parallel Environmental Commitments. Additionally, pertinent elements previously included as Avoidance and Minimization Measures and the proposed Adaptive Management and Monitoring Program would be implemented as applicable to the activities proposed under Alternative 5A.²⁷ These, too, would serve a mitigation function under CEQA. ~~In other words, all~~ of these components would function as *de facto* CEQA and NEPA mitigation measures for the construction and operations-related impacts of Alternative 5A. Details regarding the implementation of these activities under Alternative 5A are provided below and in Table 4.1-7.

The RDEIR/SDEIS describes and analyzes Environmental Commitments 3, 4, 6, 7, 8, 9, 10, 11, 12, 15, and 16 at a level of detail consistent with that applied to these activities under other alternatives in the Draft EIR/EIS. (See CEQA Guidelines, § 15126.4[a][1][D] [EIRs must discuss significant effects of mitigation measures, “but in less detail than the significant effects of the project as proposed”]; see

²⁶ While these are distinct from the environmental commitments described in Appendix 3B, *Environmental Commitments*, of the Draft EIR/EIS, both sets of commitments would apply to implementation of Alternative 5A.

²⁷ Specifically, AMMs 1-7, 10, 12-15, 18, 20-25, 30, and 37 would be carried forward under implementation of this alternative.

also *California Native Plant Society v. City of Rancho Cordova* (2009) 172 Cal.App.4th 603, 621-625 [lead agency did not violate CEQA by failing to identify the off-site location at which mitigation for impacts to on-site wetlands would be carried out].) Specific locations for implementing many of the activities associated with these commitments have not been identified at this time. Therefore, the analyses consider typical construction, operation, and maintenance activities that would be undertaken for implementation of the habitat restoration and enhancement and stressor reduction efforts. Where appropriate and necessary, implementation of individual projects associated with an Environmental Commitment would be subject to additional environmental review. (See CEQA Guidelines, §§ 15162 – 15164; 40 C.F.R. § 1502.9[c].)

Note that many of the actions formerly part of Alternative 5 but not proposed to be implemented under Alternative 5A would continue to be pursued as part of existing but separate projects and programs associated with (1) the 2008 and 2009 USFWS and NMFS BiOps (e.g., Yolo Bypass improvements, 8,000 acres of tidal habitat restoration) and (2) the 2014 California Water Action Plan. Those actions are separate from, and independent of, Alternative 5A. Therefore, for the purposes of Alternative 5A, these elements (and their associated environmental effects) are considered either as part of the No Action Alternative, as described in Section 4.2 of this RDEIR/SDEIS, or as part of the cumulative impact analysis, as described in Section 5, *Revisions to Cumulative Impact Analyses*, of this RDEIR/SDEIS.

Table 4.1-7. Environmental Commitments under Alternative 5A

<u>Environmental Commitment 3: Natural Communities Protection and Restoration</u>	
Valley/Foothill Riparian	123.91 acres
Grassland	1,034,126 acres
Vernal Pool Complex and Alkali Seasonal Wetland Complex	149,150 acres
Nontidal Marsh	118.9 acres
Cultivated Lands	11,330,964 acres
Total:	Up to 12,724,481 acres
Environmental Commitment 4: Tidal Natural Communities Restoration	Up to 55,164 acres
Environmental Commitment 6: Channel Margin Enhancement	Up to 3.1 levee miles
Environmental Commitment 7: Riparian Natural Community Restoration	Up to 22,270 acres
<u>Environmental Commitment 8: Grassland Natural Community Restoration</u>	<u>Up to 1,044 acres</u>
Environmental Commitment 9: Vernal Pool and Alkali Seasonal Wetland Complex Restoration	Up to 34 acres
Environmental Commitment 10: Nontidal Marsh Restoration	Up to 826,907 acres
Environmental Commitment 11: Natural Communities Enhancement and Management	At sites restored or protected <u>or restored</u> under Environmental Commitments 3–10
Environmental Commitment 12: Methylmercury Management	At sites restored under Environmental Commitment 4
Environmental Commitment 15: Localized Reduction of Predatory Fishes	At north Delta intake and at Clifton Court Forebay
Environmental Commitment 16: Nonphysical Fish Barrier	At Georgiana Slough

Environmental Commitment 3: Natural Communities Protection and Restoration

This action would consist of the acquisition of lands for protection and restoration of listed species habitat in perpetuity and would be implemented in the same way as described in Conservation Measure 3 in the Draft BDCP but over less area. For the purposes of Alternative 5A, this action would entail protection of up to ~~12,481~~12,724 acres, of natural communities and cultivated land, as shown in Table 4.1-7. This protection and restoration would mitigate for the loss of terrestrial species habitat associated with construction of the water conveyance facilities.

Environmental Commitment 4: Tidal Natural Communities Restoration

This action would consist of the restoration of tidal natural communities and transitional uplands and would be implemented in the same way as described in Conservation Measure 4 in Appendix D, *Substantive BDCP Revisions*, of this RDEIR/SDEIS, but over less area. For the purposes of analysis of Alternative 5A, this action would entail restoration of up to ~~164~~55 acres (including transitional uplands), as shown in Table 4.1-7. This analysis assumes that none of these 55 acres of tidal restoration will occur in the Suisun Marsh area. Tidal habitat restoration would mitigate for the physical loss of aquatic habitat associated with construction of the north Delta intake facilities. The current proposed mitigation ratio is 1:1 for a total of 55 acres. However, actual acreage may change based on further discussions with NMFS, USFWS, and DFW pertaining to the actual value of the current habitat and/or the appropriate ratio of mitigation. Based on initial discussions, the maximum ratio applied to tidal wetland mitigation is 3:1, and therefore would not exceed 165 acres for this alternative.

Environmental Commitment 6: Channel Margin Enhancement

This action would consist of the enhancement of channel margin habitat and would be implemented in the same way as described in Conservation Measure 6 in the Draft BDCP but over less linear distance. For the purposes of Alternative 5A, this action would entail enhancement of up to 3.1 levee miles, as shown in Table 4.1-7. This would mitigate for the loss of salmonid habitat associated with construction of the north Delta intake facilities.

Environmental Commitment 7: Riparian Natural Community Restoration

This action would consist of the restoration of riparian natural communities and would be implemented in the same way as described in Conservation Measure 7 in the Draft BDCP but over less area. For the purposes of Alternative 5A, this action would entail restoration of up to ~~270~~222 acres, as shown in Table 4.1-7. This would mitigate for the loss of terrestrial species habitat associated with construction of the water conveyance facilities.

Environmental Commitment 8: Grassland Natural Community

This action would consist of the restoration of grassland habitat and would be implemented in the same way as described in Conservation Measure 8 in the Draft BDCP but over less area. For the purposes of Alternative 5A, this action would entail restoration of up to 1,044 acres as shown in Table 4.1-7. This would mitigate for the loss of terrestrial species habitat associated with construction of the water conveyance facilities.

Environmental Commitment 9: Vernal Pool and Alkali Seasonal Wetland Complex Restoration

This action would consist of the restoration of vernal pool and alkali seasonal wetland complex and would be implemented in the same way as described in Conservation Measure 9 in the Draft BDCP but over less area. For the purposes of Alternative 5A, this action would entail restoration of up to 34 total acres of vernal pool complex and/or alkali seasonal wetland complex, as shown in Table 4.1-7. This would mitigate for the loss of species habitat associated with construction of the water conveyance facilities.

Environmental Commitment 10: Nontidal Marsh Restoration

This action would consist of the restoration of nontidal marsh and would be implemented in the same way as described in Conservation Measure 10 in the Draft BDCP but over less area. For the purposes of Alternative 5A, this action would entail restoration of up to ~~907~~⁸²⁶ acres of nontidal marsh, as shown in Table 4.1-7. This would mitigate for the loss of species habitat associated with construction of the water conveyance facilities.

Environmental Commitment 11: Natural Communities Enhancement and Management

This action would apply to all protected and restored habitats under Alternative 5A and would be implemented, where applicable, to manage and enhance these lands consistent with the approach described under Conservation Measure 11 in the Draft BDCP. These actions would support mitigation for the loss of terrestrial species habitat associated with construction of the water conveyance facilities.

Environmental Commitment 12: Methylmercury Management

This action would minimize conditions that promote production of methylmercury in restored tidal wetland areas and its subsequent introduction to the foodweb, and to listed species in particular. Implementation of this action would be consistent with the revised description of Conservation Measure 12 (see Appendix D, *Substantive BDCP Revisions*, of this RDEIR/SDEIS). The portions of the measure applicable to effects in the Yolo Bypass would not apply because Yolo Bypass improvements would not be implemented as part of this alternative.

Environmental Commitment 15: Localized Reduction of Predatory Fishes (Predator Control)

This action would reduce populations of predatory fishes at locations of high predation risk (i.e., predation hotspots) associated with construction and operation of the proposed water conveyance facilities. Implementation of this action would be consistent with the revised description of Conservation Measure 15 (see Appendix D, *Substantive BDCP Revisions*, of this RDEIR/SDEIS); however, for the purposes of Alternative 5A, this action would be applied only to the reach of the Sacramento River adjacent to the north Delta intake and to Clifton Court Forebay. This commitment would mitigate for effects on salmonid predation associated with operation of new conveyance facilities.

Environmental Commitment 16: Nonphysical Fish Barrier

This action would be implemented to address effects related to survival of outmigrating juvenile salmonids by installing a nonphysical barrier at Georgiana Slough to redirect fish away from channels and river reaches in which survival is lower than in alternate routes. Implementation of this action would be consistent with the revised description of Conservation Measure 16 (see Appendix D, *Substantive BDCP Revisions*, of this RDEIR/SDEIS); however, for the purposes of Alternative 5A, this action would be applied only to Georgiana Slough. This commitment would mitigate for effects on salmonid survival associated with operation of north Delta intakes and associated flows.

Avoidance and Minimization Measures

Actions associated with AMMs 1-7, 10, 12-15, 18, 20-25, 30, and 37 would apply to all construction activities under Alternative 5A and would be implemented, where applicable, to avoid and minimize impacts on listed species, consistent with the approach described in Appendix 3.C, *Avoidance and Minimization Measures*, of the Draft BDCP, and in Appendix D of this RDEIR/SDEIS. These actions would minimize the risk of impacts on species resulting from construction activities.

Adaptive Management and Monitoring Program

As a component of Alternative 5A, an adaptive management and monitoring program (AMMP) would be implemented to use new information and insight gained during the course of construction and operation of water conveyance facilities to ensure that the proposed project continues to meet applicable ESA Section 7 and CESA Section 2081(b) standards. Monitoring and research conducted under this AMMP and other programs would provide insights into changes in Delta conditions that result from climate change (e.g., sea level rise, changing hydrology in the Delta watershed, increased water temperatures); seismic events; land uses; and other factors. Extensive monitoring and research are currently underway in the Delta. To address the specific requirements of Alternative 5A, some of these existing monitoring activities would continue and, in some cases, be expanded. In other cases, existing monitoring activities would be modified to reflect specific implementation needs of the project. Information obtained from monitoring and research activities will be used by decision makers to improve the effectiveness of the conservation measures toward advancing the biological goals and objectives. For the purposes of analysis, it is assumed that the AMMP developed for Alternative 5A would not, by itself, create nor contribute to any new significant environmental effects; instead, the AMMP would influence the operation and management of facilities and protected or restored habitat associated with Alternative 5A. In the unlikely event that the AMMP suggests the need for changes in operation or new construction not addressed in this EIR/EIS, supplemental environmental review may be necessary under CEQA and NEPA. (See CEQA Guidelines, §§ 15162 – 15164; 40 C.F.R. § 1502.9[c].)

4.1.5 Approach to Environmental Analysis for Alternatives 4A, 2D, and 5A

The Lead Agencies have attempted to retain as much of the methodology and terminology that was used in the analyses of other alternatives as possible for the analysis of Alternatives 4A, 2D, and 5A. This section underscores key similarities and differences in the terminology applied in the Draft BDCP, Draft EIR/EIS, and this RDEIR/SDEIS.

Under Alternatives 4A, 2D, and 5A, it is assumed that the environmental setting and area of potential impact are consistent with those analyzed under ~~Alternative 4~~ the alternatives evaluated in the Draft EIR/EIS. While there is no requirement that activities take place within a “Plan Area” under the regulatory approach ~~that would be pursued under these alternatives used in Alternative 4A~~, it is assumed that activities associated with ~~this/these alternatives~~ would occur within this same geographical area; therefore, the term Plan Area is still applied in the impact analysis of Alternatives 4A, 2D, and 5A (and associated figures, tables, etc.). Similarly, “Conservation Zones” and “Restoration Opportunity Areas” are still applied where applicable to indicate the areas within which ~~environmental~~ Environmental commitments/Commitments would be implemented. As noted in Chapter 1, Introduction, Section 1.5 of the Draft EIR/EIS, the “study area” for the actions evaluated in this RDEIR/SDEIS is larger than the proposed Plan Area, because some of the effects of implementing the proposed project would extend beyond the boundaries of this region. Resource-specific study areas are defined in the introductions to the analyses in Chapters 5–30 of the Draft EIR/EIS.

As described above, various activities associated with the Draft BDCP conservation strategy would also apply to ~~Alternative 4A~~ these alternatives. However, as described above, activities referred to as ~~conservation~~ Conservation measures/Measures under the BDCP (as an HCP/NCCP), are instead called ~~environmental~~ Environmental commitments/Commitments for the purposes of Alternatives 4A, 2D, and 5A. However, other activities associated with the Draft BDCP conservation strategy are retained for discussion of Alternatives 4A, 2D, and 5A, including the role of avoidance and minimization measures²⁸ and the implementation of an adaptive management and monitoring program, with text provided as needed to clarify differences from those activities under ~~Alternative 4~~ their “parent” alternatives, as described in the Draft EIR/EIS. In some cases, performance standards have been added to provide additional detail regarding implementation of the ~~environmental~~ Environmental commitments/Commitments (see Table 4.1-8 of this RDEIR/SDEIS⁴). In the context of the Draft BDCP, these were often characterized as biological goals and objectives. As part of the ESA Section 7 consultation process, these elements may function (and be referred to) as ~~“mitigation conservation measures,”~~ for mitigation purposes. However, for the purposes of the RDEIR/SDEIS, these activities are considered part of the alternative and are not defined as “mitigation measures” in order to avoid confusion with those measures proposed for the purposes of CEQA and NEPA compliance. As described in Section 1, where appropriate, the RDEIR/SDEIS references the Draft BDCP. Any new information developed for the BDCP since the December 2013 public draft that is needed to adequately disclose environmental effects of Alternative 4A or other alternatives is included in Appendix D, Substantive BDCP Revisions, of this RDEIR/SDEIS.

The Section 7 and 2081(b) consultation processes address a smaller list of species than the list of BDCP covered species (Table 1-3 in the Draft BDCP). Alternatives 4A, 2D, and 5A would not include a list of “covered species;” however, this RDEIR/SDEIS retains analysis of these species, to the extent

²⁸ In response to comments contending that DWR, as Lead Agency, had failed to “comply” with the *Lotus v. Department of Transportation* (223 Cal.App.4th 645) decision, DWR and the US Bureau of Reclamation, as Federal Lead Agency, have modified Appendix 3B, *Environmental Commitments*, as part of this RDEIR/SDEIS. Avoidance and minimization measures (AMMs) and Conservation Measures (for Alternatives 1A, 1B, 1C, 2A, 2B, 2C, 3, 4, 5, 6A, 6B, 6C, 7, 8, 9)/Environmental Commitments (for Alternatives 4A, 2D, and 5A) that have been incorporated in this analysis as project features which will help avoid or minimize significant environmental effects (serving a similar role as environmental commitments) have been added to this appendix. In addition to other refinements, Appendix 3B now includes, after a summary of each mitigating project feature, one or more narrative discussions explaining both how it tends to reduce the severity of environmental effects and whether or not the level of impact reduction is sufficient to render the effects less-than-significant.

that implementation of ~~Alternative 4A~~ these alternatives could result in impacts. See Sections 4.3.7 and 4.3.8 for impact analyses pertaining to aquatic and terrestrial species. Similarly, the concept of “covered activities” would not pertain to Alternatives 4A, 2D, and 5A. For the purposes of ~~Alternative 4A~~ these alternatives, the activities considered for their potential to result in environmental impacts consist of construction and operation of proposed and existing SWP facilities in the Delta, along with implementation of ~~environmental~~ Environmental ~~commitments~~ Commitments designed to mitigate these effects. Operation and maintenance of the proposed North Bay Aqueduct Alternate Intake Project would not be included as a part of Alternative s 4A, 2D, and 5A; therefore, impacts from operating this proposed facility are not considered in the analysis of ~~Alternative 4A~~ these alternatives.

Table 4.1-4.8. -Terrestrial Biology Performance Standards for Implementing Environmental Commitments. ~~Natural Community Protection and Restoration Totals and Associated Performance Standards that Will Provide Mitigation for a Group of Listed and Non-Listed Species (acres).~~

<u>Resource</u>	<u>Performance Standards</u>
<u>Landscape Level</u>	<u>Increase the size and connectivity of the reserve system by acquiring lands adjacent to and between existing conservation lands.</u> <u>Protect and improve habitat linkages that allow terrestrial species to move between protected habitats within and adjacent to the project area.</u> <u>Increase native species diversity and relative cover of native plant species, and reduce the introduction and proliferation of nonnative species.</u>
<u>Natural Communities</u>	
<u>Valley/Foothill Riparian</u>	<u>Restore, maintain, and enhance riparian areas to provide a mix of early-, mid- and late-successional habitat types with a well-developed understory of dense shrubs.</u> <u>Maintain a single contiguous patch of 100 acres of mature riparian forest in either CZ 4 or CZ7.</u> <u>The mature riparian forest intermixed with a portion of the early- to mid-successional riparian vegetation will be a minimum patch size of 50 acres and minimum width of 330 feet.</u>
<u>Vernal Pool/Alkali Seasonal Wetland Complex</u>	<u>Protect existing vernal pool complex in the greater Byron Hills area primarily in core vernal pool recovery areas identified in the <i>Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon</i> (U.S. Fish and Wildlife Service 2005).</u> <u>Restore vernal pool and alkali seasonal wetland complex to achieve no net loss of vernal pool acreage.</u> <u>Increase the size and connectivity of protected vernal pool and alkali seasonal wetland complex in the greater Byron Hill area.</u> <u>Restore or create vernal pool and alkali seasonal wetland complex to achieve no net loss of wetted acres.</u> <u>Provide appropriate seasonal flooding characteristics for supporting and sustaining vernal pool and alkali seasonal wetland complex species.</u> <u>In grasslands surrounding protected and created vernal pools and alkali seasonal wetlands complex, increase the extent, distribution, and density of native perennial grasses intermingled with other native species, including annual grasses, geophytes, and other forbs.</u> <u>In grasslands surrounding protected and created vernal pool and alkali seasonal wetlands, increase burrow availability for burrow-dependent species.</u> <u>In grasslands surrounding protected and restored vernal pool and alkali seasonal wetlands, increase prey abundance and accessibility, especially small mammals and insects, for grassland-foraging species.</u>

<u>Resource</u>	<u>Performance Standards</u>
<u>Grassland</u>	<p><u>Restore grasslands to connect fragmented patches of protected grassland and to provide upland habitat.</u></p> <p><u>Protect up to six acres of stock ponds and other aquatic features within protected grasslands to provide aquatic breeding habitat for native amphibians and aquatic reptiles.</u></p> <p><u>Restore and sustain a mosaic of grassland vegetation alliances, reflecting localized water availability, soil chemistry, soil texture, topography, and disturbance regimes, with consideration of historical states.</u></p> <p><u>Increase the extent, distribution, and density of native perennial grasses intermingled with other native species, including annual grasses, geophytes, and other forbs.</u></p> <p><u>Increase burrow availability for burrow-dependent species.</u></p> <p><u>Increase prey abundance and accessibility, especially of small mammals and insects, for grassland-foraging species.</u></p> <p><u>Maintain and enhance aquatic features in grasslands to provide suitable inundation depth and duration and suitable composition of vegetative cover to support breeding for covered amphibian and aquatic reptile species.</u></p> <p><u>Protect grassland on the landward side of levees adjacent to restored floodplain to provide flood refugia and foraging habitat for riparian brush rabbit.</u></p> <p><u>Create or protect high-value upland giant garter snake habitat adjacent to the nontidal perennial aquatic habitat being restored and created.</u></p> <p><u>Protect 647 acres of grassland in the Byron Hills area.</u></p>
<u>Cultivated Lands</u>	<p><u>Maintain and protect the small patches of important wildlife habitats associated with cultivated lands that occur in cultivated lands within the reserve system, including isolated valley oak trees, trees and shrubs along field borders and roadsides, remnant groves, riparian corridors, water conveyance channels, grasslands, ponds, and wetlands.</u></p> <p><u>Target cultivated land conservation to provide connectivity between other conservation lands</u></p>
<u>Wildlife Species</u>	
<u>Valley Elderberry Longhorn Beetle</u>	<p><u>Mitigate impacts on elderberry shrubs by creating valley elderberry longhorn beetle habitat consistent with the U.S. Fish and Wildlife Service valley elderberry longhorn beetle conservation guidelines (provided in BDCP Appendix 3.F of the Draft BDCP) and planting elderberry shrubs in high-density clusters.</u></p> <p><u>Site valley elderberry longhorn beetle habitat restoration within drainages immediately adjacent to or in the vicinity of sites confirmed to be occupied by valley elderberry longhorn beetle.</u></p>
<u>Western Pond Turtle</u>	<u>Create and protect nontidal marsh consisting of a mosaic of nontidal perennial aquatic and nontidal freshwater emergent wetland natural communities, which will include suitable habitat characteristics for western pond turtle</u>
<u>Giant Garter Snake</u>	<p><u>Created aquatic habitat for the giant garter snake will be connected to the protected rice land or equivalent-value habitat.</u></p> <p><u>Protect giant garter snakes on restored and protected nontidal marsh and adjacent uplands and from incidental injury or mortality by establishing 200-foot buffers between protected giant garter snake habitat and roads (other than those roads primarily used to support adjacent cultivated lands and levees). Establish giant garter snake reserves at least 2,500 feet from urban areas or areas zoned for urban development.</u></p> <p><u>Protect, restore, and/or create rice land or equivalent-value habitat (e.g., perennial wetland) for the giant garter snake in Conservation Zones 4 and/or 5.</u></p>

<u>Resource</u>	<u>Performance Standards</u>
<u>California Black Rail</u>	<p><u>Create or protect high-value upland giant garter snake habitat adjacent to the nontidal perennial aquatic habitat being restored and created.</u></p> <p><u>Create connections from the Coldani Marsh/White Slough subpopulation to other areas in the giant garter snake's historical range in the Stone Lakes vicinity by protecting 255 acres of rice land or equivalent-value habitat (e.g., perennial wetland) for the giant garter snake in CZ 4 and/or CZ 5. Any portion of the 255 acres may consist of muted tidal freshwater emergent wetland and may overlap with the 160 acres of tidally restored freshwater emergent wetland if it meets specific giant garter snake habitat criteria.</u></p> <p><u>At the ecotone that will be created between restored tidal wetlands and transitional uplands (Environmental Commitment 4), provide for at least 22 acres of California black rail habitat (Schoenoplectus and Typha-dominated tidal and nontidal freshwater emergent wetland in patches greater than 0.55 acres in the south Delta) consisting of shallowly inundated emergent vegetation at the upper edge of the marsh (within 50 meters of upland refugia habitat) with adjacent riparian or other shrubs that will provide upland refugia, and other moist soil perennial vegetation.</u></p> <p><u>Create topographic heterogeneity in restored tidal wetlands (Environmental Commitment 4).</u></p>
<u>Greater Sandhill Crane</u>	<p><u>Protect high- to very high-value habitat for greater sandhill crane (see Table 12-4A-28 in Section 4.3.8 for definition of habitat values), with at least 80% maintained in very high-value types in any given year. This protected habitat will be within 2 miles of known roosting sites in Conservation Zones 3, 4, 5, and/or 6 and will consider sea level rise and local seasonal flood events, greater sandhill crane population levels, and the location of foraging habitat loss. Patch size of protected cultivated lands will be at least 160 acres.</u></p> <p><u>Create at least 320 acres of managed wetlands (part of the nontidal wetland restoration acreage) in minimum patch sizes of 40 acres within the Greater Sandhill Crane Winter Use Area in CZs 3, 4, 5, or 6, with consideration of sea level rise and local seasonal flood events. The wetlands will be located within 2 miles of existing permanent roost sites and protected in association with other protected natural community types (excluding nonhabitat cultivated lands) at a ratio of 2:1 upland to wetland to provide buffers around the wetlands.</u></p> <p><u>Create at least two 90-acre wetland complexes within the Stone Lakes National Wildlife Refuge project boundary. The complexes will be no more than 2 miles apart and will help provide connectivity between the Stone Lakes and Cosumnes River Preserve greater sandhill crane populations. Each complex will consist of at least three wetlands totaling at least 90 acres of greater sandhill crane roosting habitat, and will be protected in association with other protected natural community types (excluding nonhabitat cultivated lands) at a ratio of at least 2:1 uplands to wetlands (i.e., two sites with at least 90 acres of wetlands each). One of the 90-acre wetland complexes may be replaced by 180 acres of cultivated lands (e.g., cornfields) that are flooded following harvest to support roosting cranes and provide highest-value foraging habitat, provided such substitution is consistent with the long-term conservation goals of Stone Lakes National Wildlife Refuge for greater sandhill crane.</u></p> <p><u>Create an additional 95 acres of roosting habitat within 2 miles of existing permanent roost sites. The habitat will consist of active cornfields that are flooded following harvest to support roosting cranes and that provide highest-value foraging habitat. Individual fields will be at least 40 acres and can shift locations throughout the Greater Sandhill Crane Winter Use Area, but will be sited with consideration of the location of roosting habitat loss and will be in place prior to</u></p>

<u>Resource</u>	<u>Performance Standards</u>
	<u>roosting habitat loss.</u>
<u>Swainson's Hawk</u>	<p><u>Conserve 1 acre of Swainson's hawk foraging habitat for each acre of lost foraging habitat.</u></p> <p><u>Protect Swainson's hawk foraging habitat with at least 50% in very high-value habitat (see Table 12-4A-35 in Section 4.3.8 for a definition habitat value) production and above -1 foot above mean sea level.</u></p> <p><u>Protect Swainson's hawk foraging habitat with at least 50% in very high-value habitat production.</u></p>
<u>Tricolored Blackbird</u>	<p><u>Protect and manage occupied or recently occupied (within the last 15 years) tricolored blackbird nesting habitat located within 3 miles of high-value foraging habitat in Conservation Zones 1, 2, 8, or 11. Nesting habitat will be managed to provide young, lush stands of bulrush/cattail emergent vegetation and prevent vegetation senescence.</u></p> <p><u>Protect high- to very high-value breeding-foraging habitat within 5 miles of occupied or recently occupied (within the last 15 years) tricolored blackbird nesting habitat. At least 130 acres will be within 3 miles of the 42 acres of nontidal wetland nesting habitat protected.</u></p> <p><u>Protect moderate-, high-, or very high-value cultivated lands as nonbreeding foraging habitat, at least 50% of which is of high or very high value.</u></p> <p><u>Nonbreeding habitat mitigation needs assumed to be met through early-successional riparian (blackberry) and tidal (scirpus) restoration.</u></p>
<u>Riparian Brush Rabbit</u>	<p><u>Of the protected valley/foothill riparian natural community, protect and maintain 19 acres of early- to mid-successional riparian habitat that meets the ecological requirements of the riparian brush rabbit and that is within or adjacent to or that facilitates connectivity with existing occupied or potentially occupied habitat.</u></p> <p><u>Protect and maintain 19 acres of early- to mid-successional habitat that meets the ecological requirements of the riparian brush rabbit and that is within or adjacent to or that facilitates connectivity with existing occupied or potentially occupied habitat.</u></p> <p><u>Restore and maintain 19 acres of early- to mid-successional riparian brush rabbit habitat that meets the ecological requirements of the riparian brush rabbit and that is within or adjacent to or that facilitates connectivity with existing occupied or potentially occupied habitat.</u></p> <p><u>Create and maintain high-water refugia in the 19 acres of restored riparian brush rabbit habitat and the 19 acres of protected riparian brush rabbit habitat, through the retention, construction and/or restoration of high-ground habitat on mounds, berms, or levees, so that refugia are no further apart than 20 meters.</u></p> <p><u>In protected riparian areas that are occupied by riparian brush rabbit, monitor for and control nonnative predators that are known to prey on riparian brush rabbit.</u></p> <p><u>Of the 1,060 acres of grasslands protected, protect 227 acres of grasslands on the landward side of levees adjacent to restored floodplain to provide flood refugia and foraging habitat for riparian brush rabbit.</u></p>
<u>Plant Species</u>	
<u>Vernal Pools Species</u>	<u>Protect at least two currently unprotected occurrences of alkali milk-vetch in the Altamont Hills or Jepson Prairie core recovery areas.</u>
<u>Alkali Seasonal Wetland Species</u>	<u>Protect two currently unprotected occurrences of San Joaquin spearscale in Conservation Zones 1, 8, or 11.</u>
<u>Tidal Wetland Species</u>	<p><u>No net loss of Mason's lilaeopsis and delta mudwort occurrences within restoration sites.</u></p> <p><u>No net loss of Delta tule pea and Suisun Marsh aster occurrences within</u></p>

1

Resource	Performance Standards		
restoration sites.			
Natural Community	Protection	Restoration	Performance Standards
Riparian (Environmental Commitments 3 and 7)	125	273	<ul style="list-style-type: none">Restore, maintain, and enhance riparian areas to provide a mix of early-, mid- and late-successional habitat types with a well-developed understory of dense shrubs.Maintain at least 500 acres of mature riparian forest in Conservation Zones 4 or 7.The mature riparian forest intermixed with a portion of the early- to mid-successional riparian vegetation will be a minimum patch size of 50 acres and minimum width of 330 feet.
Bats			
Roosting	{271}	{271}	
Foraging	{8,475}		
Least Bell's vireo	75	75	
Swainson's hawk			
Nesting habitat	50	50	
Tricolored blackbird			
Nonbreeding habitat-roosting ²⁹	{42}		
Western yellow-billed cuckoo			
Breeding habitat	{12}	{12}	
Migratory habitat	{51}	{51}	
Species with unique mitigation requirements in addition to those listed above:			
Riparian brush rabbit			<ul style="list-style-type: none">Protect and maintain 19 acres of early- to mid-successional habitat that meets the ecological requirements of the riparian brush rabbit and that is within or adjacent to or that facilitates connectivity with existing occupied or potentially occupied habitat.Restore and maintain 19 acres of early- to mid-successional riparian brush rabbit habitat that meets the ecological requirements of the riparian brush rabbit and that is within or adjacent to or that facilitates connectivity with existing occupied or potentially occupied habitat.Create and maintain high-water refugia in the 19 acres of restored riparian brush rabbit habitat and the 19 acres of protected riparian brush rabbit habitat, through the retention, construction and/or restoration of high-ground habitat on mounds, berms, or levees, so that refugia are no further apart than 20 meters.In protected riparian areas that are occupied by riparian brush rabbit, monitor for and control nonnative predators that are known to prey on riparian brush rabbit.
Riparian	19	19	
Valley elderberry longhorn beetle			<ul style="list-style-type: none">Mitigate impacts on elderberry shrubs by creating valley elderberry longhorn beetle habitat consistent with the U.S. Fish and Wildlife Service valley elderberry longhorn beetle conservation guidelines (provided in Appendix 3.F of the Draft BDCP) and
Riparian	89	89	
Non-riparian ³⁰		148	

²⁹ Tricolored blackbird nonbreeding roosting habitat assumed to be provided by blackberry in restored, early-successional riparian areas.

³⁰ Though this is non-riparian mapped habitat, it is likely to be mitigated with riparian or riparian-adjacent habitat so this kept this under the riparian heading.

Natural Community	Protection	Restoration	Performance Standards
			<ul style="list-style-type: none"> planting elderberry shrubs in high-density clusters. Site valley elderberry longhorn beetle habitat restoration within drainages immediately adjacent to or in the vicinity of sites confirmed to be occupied by valley elderberry longhorn beetle.
Nontidal Wetland (Environmental Commitments 3 and 10)	119	907	<ul style="list-style-type: none"> There are no community-wide protection or restoration requirements, all are species-specific.
Greater sandhill crane			<ul style="list-style-type: none"> All original crane roosting habitat creation BGOs still apply. See Public Draft.
Roosting and foraging—Permanent		575	
Roosting and foraging—Temporary			
Tricolored blackbird			<ul style="list-style-type: none"> Protect and manage occupied or recently occupied (within the last 15 years) tricolored blackbird nesting habitat located within 5 miles of high-value foraging habitat in Conservation Zones 1, 2, 8, or 11. Nesting habitat will be managed to provide young, lush stands of bulrush/cattail emergent vegetation and prevent vegetation senescence.
Breeding habitat-nesting	42		
Giant garter snake			<ul style="list-style-type: none"> Created aquatic habitat for the giant garter snake will be connected to the protected rice land or equivalent value habitat. Protect giant garter snakes on restored and protected nontidal marsh and adjacent uplands and from incidental injury or mortality by establishing 200-foot buffers between protected giant garter snake habitat and roads (other than those roads primarily used to support adjacent cultivated lands and levees). Establish giant garter snake reserves at least 2,500 feet from urban areas or areas zoned for urban development.
Aquatic—nontidal ³⁴		255	
Western pond turtle/Plants	77	77	<ul style="list-style-type: none"> Create and protect nontidal marsh consisting of a mosaic of nontidal perennial aquatic and nontidal freshwater emergent wetland natural communities, with suitable habitat characteristics for western pond turtle.
Cultivated Lands (Environmental Commitment 3)	10,064		<ul style="list-style-type: none"> There are no community-wide protection or restoration requirements, all are species-specific.
Sandhill crane ⁵			<ul style="list-style-type: none"> Protect high- to very high-value habitat for greater sandhill crane (see Table XX for definition of habitat values), with at least 80% maintained in very high-value types in any given year. This protected habitat will be within 2 miles of known roosting sites in Conservation Zones 3, 4, 5, and/or 6 and will consider sea level rise and local seasonal flood events, greater sandhill crane population levels, and the location of foraging habitat loss. Patch size of protected cultivated lands will be at least 160 acres.
Sandhill crane-Foraging (primarily corn)	3,892		
Swainson's hawk			<ul style="list-style-type: none"> Conserve 1 acre of Swainson's hawk foraging habitat for each acre of lost³⁴ foraging habitat. Protect Swainson's hawk foraging habitat with at
Foraging habitat(primarily alfalfa, irrigated pasture, and grain and	5,917		

³⁴“Lost” is the combination of permanent habitat loss and loss due to borrow and spoil sites that will eventually be restored.

Natural Community	Protection	Restoration	Performance Standards
hay)			<ul style="list-style-type: none"> least 50% in very high-value habitat (see Table XX 12-4A-35 in Section 4.3.8 for a definition habitat value) production and above 1 foot above mean sea level. Protect Swainson's hawk foraging habitat with at least 50% in very high-value habitat production. Up to 200 acres can occur on lands with surface elevations greater than -1 foot NAVD88.
Tricolored blackbird			<ul style="list-style-type: none"> Protect high- to very high-value breeding-foraging habitat within 5 miles of occupied or recently occupied (within the last 15 years) tricolored blackbird nesting habitat. At least 130 acres will be within 5 miles of the 42 acres of nontidal wetland nesting habitat protected.
Breeding habitat-ag foraging (primarily irrigated pasture, including alfalfa, and grain and hay)	1,965		
Nonbreeding habitat-foraging ag (primarily corn and irrigated pasture)	2,626	0	<ul style="list-style-type: none"> Protect moderate-, high-, or very high-value cultivated lands as nonbreeding foraging habitat, at least 50% of which is of high or very high value.
Giant garter snake			<ul style="list-style-type: none"> Protect, restore, and/or create rice land or equivalent-value habitat (e.g., perennial wetland) for the giant garter snake in Conservation Zones 4 and/or 5.
Aquatic – nontidal (rice)	255		
Vernal Pool/Alkali Seasonal Wetland Complex (Environmental Commitments 3 and 9)	149	34	<ul style="list-style-type: none"> Protect existing vernal pool complex in the greater Byron Hills area primarily in core vernal pool recovery areas identified in the <i>Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon</i> (U.S. Fish and Wildlife Service 2005). Restore vernal pool and alkali seasonal wetland complex to achieve no net loss of vernal pool acreage. Increase the size and connectivity of protected vernal pool and alkali seasonal wetland complex in the greater Byron Hill area. Restore or create vernal pool and alkali seasonal wetland complex to achieve no net loss of wetted acres. Provide appropriate seasonal flooding characteristics for supporting and sustaining vernal pool and alkali seasonal wetland complex species. In grasslands surrounding protected and created vernal pools and alkali seasonal wetlands complex, increase the extent, distribution, and density of native perennial grasses intermingled with other native species, including annual grasses, geophytes, and other forbs. In grasslands surrounding protected and created vernal pool and alkali seasonal wetlands, increase burrow availability for burrow-dependent species. In grasslands surrounding protected and restored vernal pool and alkali seasonal wetlands, increase prey abundance and accessibility, especially small mammals and insects, for grassland-foraging species.
Listed and nonlisted crustaceans			
Vernal pool complex	49	25	
Degraded vernal pool complex	19	9	
Indirect effects mitigation	82		
Grassland (Environmental	2,130		<ul style="list-style-type: none"> Restore grasslands to connect fragmented patches

Natural Community	Protection	Restoration	Performance Standards
Commitment 3)			<ul style="list-style-type: none">of protected grassland and to provide upland habitat.Protect stock ponds and other aquatic features within protected grasslands to provide aquatic breeding habitat for native amphibians and aquatic reptiles.Restore and sustain a mosaic of grassland vegetation alliances, reflecting localized water availability, soil chemistry, soil texture, topography, and disturbance regimes, with consideration of historical states.Increase the extent, distribution, and density of native perennial grasses intermingled with other native species, including annual grasses, geophytes, and other forbs.Increase burrow availability for burrow-dependent species.Increase prey abundance and accessibility, especially of small mammals and insects, for grassland-foraging species.Maintain and enhance aquatic features in grasslands to provide suitable inundation depth and duration and suitable composition of vegetative cover to support breeding for covered amphibian and aquatic reptile species.
San Joaquin kit fox	647		
Tricolored blackbird			
Breeding habitat-foraging	806		
Nonbreeding habitat-foraging	254		
California red-legged frog			
Upland cover and dispersal habitat	68		
California tiger salamander			
Terrestrial cover and aestivation	61		
Species with unique mitigation requirements for grassland protection and restoration separate from those listed above.			
Riparian brush rabbit			<ul style="list-style-type: none">Protect grasslands on the landward side of levees adjacent to restored floodplain to provide flood refugia and foraging habitat for riparian brush rabbit.
Grassland habitat	227		
Giant garter snake			<ul style="list-style-type: none">Create or protect high-value upland giant garter snake habitat adjacent to the nontidal perennial aquatic habitat being restored and created.
Upland-high	843		
Tidal Wetlands (Environmental Commitment 4)		182	
Chinook Salmon		160	
Black Rail	22	22	
Tricolored blackbird			
Nonbreeding habitat-roosting ²	42		<ul style="list-style-type: none">Nonbreeding habitat mitigation needs assumed to be met through early-successional riparian (blackberry) and tidal (scirpus) restoration.
Aquatic breeding, foraging, and movement (miles)			
Mason's lilaeopsis ³	0	39	

4.1.6 Assumptions for the Purposes of Analysis

For the purposes of analyzing the environmental effects associated with Alternatives 4A, 2D, and 5A, a number of assumptions were necessary.

Environmental Baselines and Implementation Schedule

The same “Existing Conditions” baseline defined in the Draft EIR/EIS applies to Alternative 4A for the purposes of CEQA impact analysis. Therefore, all CEQA conclusions associated with Alternative 4A, 2D, and 5A are made in comparison to the same Existing Conditions baseline applied for all other alternatives. However, because of the different approach for ESA compliance envisioned under Alternatives 4A, 2D, and 5A, the No Action Alternative, as applied to Alternative 4A these new alternatives only, has been modified for the purposes of making NEPA determinations with respect to Alternatives 4A, 2D, and 5A in the RDEIR/SDEIS as described below. For the other action alternatives in the Draft EIR/EIS, including Alternative 4, that contemplated an HCP/NCCP permit term of 50 years, the No Action Alternative, as found in the Draft EIR/EIS, remains unchanged, as it, too, had a time horizon of 50 years.

Under Alternatives 4A, 2D, and 5A, the 2009 NMFS BiOp RPAs related to Yolo Bypass improvements (Actions I.6.1, I.6.2, and I.7) and the 2008 USFWS BiOp RPA related to 8,000 acres of tidal habitat restoration (Component 4) would be considered part of the No Action Alternative. Under Alternatives 4A, 2D, and 5A, the BDCP would no longer be the vehicle to implement these actions; instead, they would be pursued and implemented as part of existing processes, including the development of the *Yolo Bypass Salmonid Habitat Restoration and Fish Passage Implementation Plan* and the *Remanded Biological Opinions on the Coordinated Long-Term Operation of the CVP and SWP*. Additionally, because a 50-year permit would not be pursued under Alternatives 4A, 2D, and 5A, impact analyses reliant on physical modeling (primarily CALSIM II and DSM2) apply “Early Long-Term” model results, which are consistent with conditions approximately 15 years following project approval. However, because the project would continue indefinitely, the analysis qualitatively examines impacts at the Late Long-Term timeframe for Alternatives 4A, 2D, and 5A. Where impacts do not differ between the early long-term and the late long-term, this analysis is not specifically called out.

Physical Modeling

As described above, impact analyses reliant on physical modeling apply results consistent with an “Early Long-Term” timeframe. Based on the assumptions used for the original purposes of these model runs, these results also assume implementation of two elements, Yolo Bypass improvements and 25,000 acres of tidal wetland restoration. These two elements were included in the modeling because they were components of Alternative 4, for which the only as a modeling reference point was originally conducted. These two elements, however, are not proposed as part of Alternative 4A. Instead, other words, these two elements would be pursued and implemented separately as part of other ongoing BiOp RPA efforts rather than as part of Alternative 4A. Even so, the Lead Agencies have determined that they may reasonably rely on the modeling conducted for Alternative 4 to accurately predict the environmental effects of Alternative 4A. At the time the Lead Agencies developed Alternative 4 in concept and wanted to test it as a potentially viable new subalternative, the Lead Agencies already possessed ELT modeling outputs for Alternative 4, which included the two elements. The Lead Agencies conducted Additional sensitivity modeling was conducted to assess the validity of these results consistent with the Alternative 4A project description whether or not the existing ELT modeling for Alternative 4 accurately predicted the environmental effects of Alternative 4A. The new assessment concluded in the affirmative on that question. Their conclusions of from this sensitivity analysis comparison are provided in Appendix B, Supplemental Modeling for Alternative 4A, of this RDEIR/SDEIS. Additionally, as described in Table 4.1-2 in this RDEIR/SDEIS, the operations for Alternative 4A include a new criterion for spring

outflow to specifically avoid unacceptable effects on longfin smelt. For the purposes of impact analysis under Alternative 4A, applicable analyses evaluate a range of impacts, bounded by the early long-term modeling results generated for Alternative 4, Scenarios H3 and Scenario H4.

4.1.7 Agency Roles and Responsibilities

[Placeholder for discussion of agency roles and permitting processes, etc.].

Administrative
Draft